EUROPEAN ASSOCIATION OF ZOOS AND AQUARIA

TAG Reports 2022

CONTENT

Cover image

The Sunda or Greater slow loris (*Nycticebus coucang*) is one of the many species covered by new Best Practice Guidelines published in 2022. Here an individual rescued from pet trade and rehabilitated by the Kukang Rescue Program, supported by many EAZA Members © Lucie Čižmářová

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INTRODUCTION

This Annual Report provides a detailed overview of the many and diverse activities that EAZA's 42 Taxon Advisory Groups (TAGs) were involved in over the course of 2022. It demonstrates successes and progress achieved across the EAZA TAGs. All but the Coral and Caprinae TAGs were able to provide a report.

2022 was the year of the invasion of Ukraine by Russian government forces, which not only had disastrous consequences for all zoos in Ukraine, their staff and their families, the animals in their care and the communities they serve but also impacted collaborations with institutions abroad, including the transfer of animals, attendance to meetings and in situ conservation work.

Fortunately, 2022 also saw a gradual return to a (new) normal after the COVID-19 pandemic restrictions. So, while benefitting from the lessons learnt, and continued use of online platforms to meet, there were also the first face-to-face meetings with as highlight the EAZA Annual Conference in Albufeira (Portugal). This provided the opportunity for the TAGs to meet again, reconnect and show the progress made during the COVID-19 pandemic.

The implementation of the new EAZA population management structure continued with Regional Collection Plan (RCP) workshops held, either online, face-to-face or in a hybrid set up, for the Felid TAG, Reptile TAG – sauria, Amphibian TAG – dendrobates, Small mammal TAG – xenartha and pangolins, Galliformes TAG, Marine teleost TAG and Charadriiformes TAG. Upon completion, RCP publications are made available on the Member Area of the EAZA website. The RCP process informs which species EAZA will actively manage across its Member zoos and aquariums as part of an EAZA Ex situ Programme (EEP). Each EEP will then develop its own tailor-made Long-Term Management Plan (LTMP), which outlines the strategy towards achieving the species-specific goals set as part of the RCP process. In 2022, LTMPs were published for 35 species, resulting in 10 TAGs for which all or most EEPs have an LTMP.

25 new style EEPs were approved bringing the total to 226 by the end of 2022. In addition to these, TAGs will continue to oversee 112 old style EEPs and 113 European Studbooks (ESBs) until all have completed their new style RCP process. Four old style programmes were discontinued. To increase public awareness about the programmes and raise their profile, 61 EEP pages are now available on the EAZA website (www.eaza.net/conservation/programmes/eep-pages).

This report also demonstrates the wide variety of species conservation activities that the TAGs were involved in during the course of the year, including but not limited to: supporting International Union for the Conservation of Nature (IUCN) Red List assessments, new species discoveries, contributions to 'One Plan Approach' conservation planning in collaboration with an increasing number of IUCN Species Survival Commission (SSC) Specialist Groups (SGs), head-starting programmes, training in mitigation of disease impacting wild populations, management of populations with insurance and ARK roles, reinforcement- and reintroduction programmes and fundraising. It is truly exciting to see that the members of EAZA TAGs are involved across all three parts of the IUCN SSC 'Assess, Plan, Act conservation cycle'. Cooperation with field conservation partners and experts, in addition to those with IUCN SSC SGs, stayed strong and continued to grow.

Another core task of TAGs is (to coordinate) developing EAZA Best Practice Guidelines (BPG) that reflect the best practice management in human care of the respective taxa. With seven BPGs completed, approved and freely available on the EAZA website, 2022 was yet another productive year in this regard.

In addition, the TAGs worked on other tasks including providing expertise input for EAZA's lobbying work at the European Union and representation with other organisations. The transport of animals between the EU and the UK continued to be a challenge in 2022. Despite these challenges, optimism remains to see a slow but steady increase in transports thanks to the hard work and persistence of the Members, EEPs and TAGs, and not least the strong collaboration with colleagues at the British and Irish Association of Zoos and Aquariums (BIAZA).

In April 2022, the fourth World Association of Zoos and Aquariums (WAZA) joint TAG Chairs meeting took place in Long Beach (USA) with a good number of EAZA TAGs attending and contributing to the programme. This provided the necessary opportunity to ensure familiarity with the work of other associations, identify potentials for pitfalls and prospects for collaboration.

For more information on topics raised in this report, please contact the EAZA Executive Office (EEO) at info@eaza.net. EAZA extends its thanks to all the Chairs, Vice Chairs, Programme Coordinators and Committee members for their support, commitment and enthusiasm to EAZA in 2022.

GLOSSARY

AZA: Association of Zoos and Aquariums (USA)
BPG: Best Practice Guidelines
CITES: Convention on International Trade in Endangered Species of Wild Fauna and Flora
EEO: EAZA Executive Office
EEP: EAZA Ex situ Programme
ESB: European Studbook
GSMP: Global Species Management Plan
IUCN: International Union for the Conservation of Nature
LTMP: Long-Term Management Plan
MON-P: Monitored-by-designated-person Programme
MON-T: Monitored-by-TAG Programme, including MON-T REPLw (Replace with), MON-T Phase out and MON-T DNO (Do Not Obtain)
(see EAZA Population Management Manual in EAZA Governing Documents for more details)
RCP: Regional Collection Plan
SEAZA: Southeast Asian Zoos and Aquariums Association
SG: Specialist Group
SSC: Species Survival Commission
SSP: Species Survival Plan
TAG: Taxon Advisory Group
WAZA: World Association of Zoos and Aquariums
ZAA: Zoo and Aquarium Association (Australasia)
ZIMS: Zoological Information Management System

The EEP for Black hornbill (*Anthracoceros malayanus*) is among the species that witnessed remarkable breeding successes in 2022, with pairs successfully rearing multiple clutches © Paradise Wildlife Park

1 TERRESTRIAL INVERTEBRATE

TAG Chair: Melissa Bushell (Bristol Zoo, Bristol, United Kingdom) • Vice Chairs: Tamás Papp (Chester Zoo, Chester, United Kingdom) and Vítek Lukáš (Ústí nad Labem Zoo, Ústí nad Labem, Czechia)

INTRODUCTION

It has been another busy year for invertebrates and although the EAZA Terrestrial Invertebrate TAG (TITAG) has been quiet, there have been a lot of developments in EEPs and conservation programmes across collections. Plus, discussions have been taking place on the development of subgroups within the TITAG and the commencement of some EEPs that still do not have Coordinators. 2023 promises to be a busy year if all these plans come to fruition!

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

The Polynesian tree snail EEP has had some interesting developments over the year, with a 15% increase in the total populations of species to 10,526 snails in total; the majority of species have seen significant rises in populations across collections. This is excellent news, with planned releases to take place in 2023.

Unfortunately, the COVID-19 pandemic prevented resumption of the reintroductions in 2022 but continued close collaboration with French Polynesian Government's Direction de l'environnement (Diren) colleagues over the last year has enabled the scheduling of reintroductions to resume for Tahitian and Moorean *Partula* species in late March 2023 followed by Huahine and Raiatea species reintroductions in September 2023.

This will be the sixth year of reintroductions and whilst it's certainly too early to consider any of the released populations to be successfully established, initial analysis of the post-release population monitoring by Diren colleagues and Justin Gerlach (University of Cambridge, UK) provides cautious optimism for most of the released species. The forthcoming 2023 reintroductions will provide a valuable opportunity for improving post-release dispersal behaviour and improved monitoring of snails in the high canopy.

The Frégate beetle EEP was transferred to Jersey Zoo (UK), with Graeme Dick taking on the role of EEP Coordinator. The population under human care has been quite small for a while, but with additional collections taking on populations it should bounce back, especially with the production of updated BPG in 2023.

The Lord Howe stick insect EEP continues to do well, although there is still only one collection (Bristol Zoo, UK) with the species. Numbers have increased to over 150 animals, with the sixth generation being produced in 2022. Plans are for additional collections to join the EEP in 2023, including Prague Zoo (Czechia), and for some exchange of eggs to take place between Bristol Zoo and San Diego Zoo (USA).

Adult giant magnolia snail (*Bertia cambojiensis*) with hatchlings at Chester Zoo © Gerardo Garcia

The Desertas wolf spider EEP has seen an increase of holding collections to a total of 13 and a population of 1,140 individuals under human care. Habitat work on Deserta Grande Island (Portugal) was completed in 2022 and monitoring is taking place to see how the wild population is faring, with some initial positive results. Further zoological collections are expected to join the EEP in 2023.

ACHIEVEMENTS DURING THE YEAR

The TITAG held one meeting this year at the EAZA Annual Conference at ZooMarine (Portugal) – unfortunately the TITAG Chair was unable to attend, but Gerardo Garcia (North of England Zoological Society / Chester Zoo, referred to as 'Chester Zoo' in the rest of the report; UK) stepped in to run the session.

CONSERVATION AND RESEARCH

There has been a great deal of conservation work with invertebrates at Chester Zoo this year.

The scarce yellow sally (*Isogenus nubecula*), a rapidly declining species of stonefly, was bred under human care at Chester Zoo in a world first in 2022. Larvae were collected from the species' only known UK location on the river Dee, reared to adulthood and then successfully reproduced, with well over 100 larvae in the F1 generation. This is the start of a project to reinforce the Dee population through releases.

Further reintroductions of the two Critically Endangered Bermuda land snails (genus *Poecilozonites*) were conducted, with the total number of released snails now exceeding 100,000. Releases have occurred at over 20 locations in Bermuda, with confirmation of population establishment and breeding from at least six sites. Further surveys in 2023 are expected to confirm establishment at several additional sites.

The breeding project of the three Critically Endangered endemic Desertas Islands land snails is continuing, with the world first breeding – under human care - of *Atlantica calathoides* occurring in 2022, alongside further breeding

of *Discula lyelliana* and *Geomitra grabhami.* This confirms *A. calathoides* is an egg layer. Discussions are ongoing with the Institute for the Conservation of Nature and Forests (Instituto das Florestas e Conservação da Natureza, Portugal), the *in situ* partner in Madeira, about the next steps of the project and possible reintroductions.

Chester Zoo have also had tremendous success with breeding the giant magnolia snail (*Bertia cambojiensis*) in 2022. Around 85% of the global population under human care of this Critically Endangered species is now at the zoo.

Discussions happened between TITAG members about the possibility of setting up a European Invertebrate Conservation subgroup within the TITAG. Although they have stalled slightly, this is being picked up again in 2023, with plans for online meetings to take place to shape the direction of the subgroup and the TITAG in general.

2 FRESHWATER TELEOST

TAG Chair: Brian Zimmerman (Bristol Zoological Society, Bristol, United Kingdom) • Vice Chair: Anton Weissenbacher (Vienna Zoo, Vienna, Austria)

INTRODUCTION

The EAZA Freshwater Teleost TAG made great progress in 2022, with strong development across several of the family-based EEPs. The TAG now has Coordinators for 10 freshwater teleost families and two more applications are nearing readiness for approval. All Coordinators are by default member of the TAG and over the course of the year they met to cover a range of common challenges and objectives, including how best to work with the private sector, group population management and data management/record-keeping. Additionally, several of the EEPs have progressed some strong *in situ* collaboration with new partners identified to support conservation of some highly threated species in each family, a key goal of the TAG.

Collecting *Aphanius transgrediens* from Lake Acigol in May 2022
© Alex Cliffe

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

The TAG, and EEP Coordinator for Pupfish (Cyprinodontidae inc. Aphaniidae), Alex Cliffe (Zoological Society of London (ZSL) Whipsnade Zoo, UK), worked with EAZA Population Biologists, Elmar Fienieg, María Paula Balcázar-Vargas and Nora Hausen to create the first LTMP for Pupfish species. Priority species within the EEP-managed families Aphaniidae and Cyprinodontidae were selected based on conservation need and their existence in EAZA zoos/aquariums.

Additionally, the EEO team worked with the EEP Coordinator for Aplocheilidae killifishes, Samantha Guillaume (ZSL, UK), to begin a feasibility assessment for Studbook management in the Zoological Information Management Software (ZIMS) for group-managed freshwater teleosts that are highly fecund, egg-laying species.

The Alestidae EEP Coordinator, Előd Szanati (Budapest Zoo, Hungary) sent a survey to explore the possibilities of greater EAZA participation in maintaining species in this family, to expand the populations of key species in European zoos. New holders are desperately needed, and because many species are not often kept in zoos currently, a plan is being devised to create educational materials to promote the family and establish key species at Budapest Zoo that can be later distributed. With this goal in mind 0.0.23 Endangered *Alestopetersius smykalai* were brought to Budapest Zoo for breeding trials and hopefully they will form part of a sustainable insurance population.

ACHIEVEMENTS DURING THE YEAR

The TAG has recruited a Veterinary Advisor, Amanda Guthrie, and Simon Spiro (both ZSL London Zoo, UK) has agreed to take on the role of Veterinary Advisor for the Pupfish EEP. These are very welcome support to the TAG and this EEP, given both Amanda and Simon's vast experience of dealing with freshwater teleost health issues including mycobacterium and other transmissible diseases.

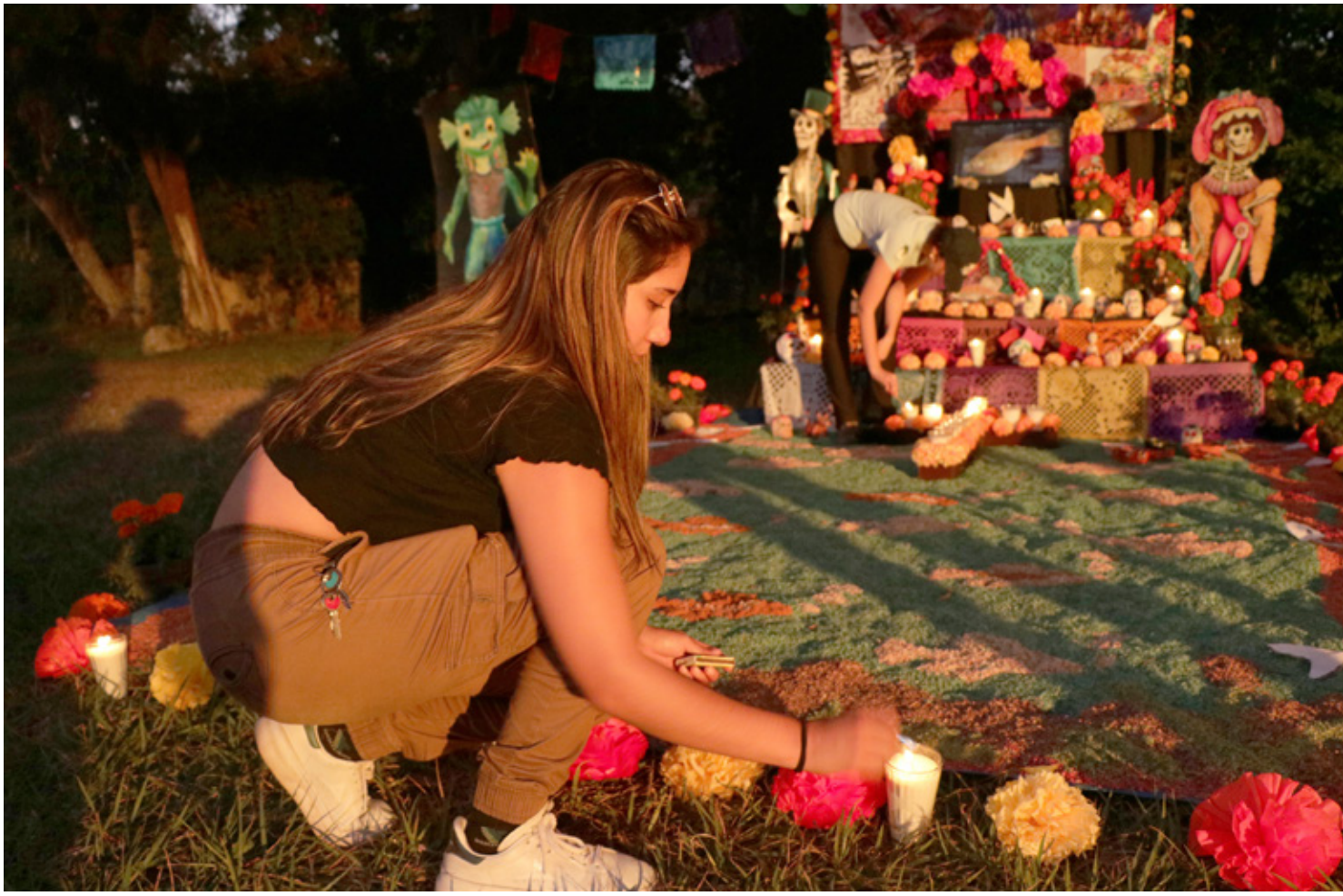
Előd Szanati, and the graphics team at Budapest Zoo designed a new logo for the TAG which was unanimously approved and greatly appreciated by the TAG.

COLLABORATIONS

The Percidae EEP Coordinator, Sabine Wirtz of AQUATIS Aquarium-Vivarium (Switzerland), has started a proposal for *ex situ* conservation for the Critically Endangered European endemic, *Zingel asper* in Switzerland and collaboration is currently under consideration with the Swiss authorities as well as a range of other partners in the zoo and research communities.

Alex Cliffe attended the British Killifish Association Conference in Nottingham (UK) to update attendees on the recently established EEP and its importance. We expect stronger knowledge exchanges with the private sector in the future.

Markéta Rejlková of Zoo Ostrava (Czechia), initiated cooperation with the international conservation breeding



A student decorates the golden skiffia-themed Day of the Dead altar © Gerardo Garcia, Chester Zoo

programme "Xiphophorus – Northern Platyfish" under the guidance of the Austrian Association for Vivaristics and Ecology which will prove to be vital, as members of this project provide fish necessary to strengthen *ex situ* populations of species Extinct in the Wild and managed within the EEP for Poeciliidae.

CONSERVATION AND RESEARCH

The EEP Coordinator Markéta Rejlková wrote an article about the new EEP for Poeciliidae, urging private keepers to focus on threatened species and cooperate with zoos and other institutions to help the conservation of poeciliids. Two TAG members (Anton Weissenbacher, Vienna Zoo, Austria and Markéta Rejlková) participated in a workshop on *ex situ* conservation of freshwater biota within the frames of the IUCN One Plan Approach, where multiple stakeholders discussed the creation and management of conservation breeding programmes regarding the requirements and standards of EAZA, international and national NGOs, scientific institutions, associations of private aquarists etc. This meeting was important for emphasising the *in situ* component and the comprehensive, cooperative approach to the conservation of threatened species in aquariums.

Alex Cliffe met with Baran Yoğurtçuoğlu of Hacettepe University in Turkey to assess the university campus lake as a viable refugium for *Aphanius transgrediens* and to review the potential for the university to support the killifish in aquarium systems in their labs for research opportunities.

Gerardo Garcia, Curator of Lower Vertebrates and Invertebrates and Becky Goodwin, Lead Aquarist from Chester Zoo (UK) travelled to Mexico in October-November to meet with partners from the Goodeid Working Group and University of Michoacan to discuss goodeid conservation. The focus of the trip was the release of over 1,000 golden skiffia (*Skiffia francescae*) into the Teuchitlán river. This species is listed as Extinct in the Wild by the IUCN and the release garnered a lot of media attention, including tweets from Leonardo Dicaprio!

A dissemination workshop was held at Bristol Zoo (UK) for Project AFRESH 'Application of innovative methodologies for the wide range monitoring of native and alien freshwater fish of Greece' in which a key focus was the Greek *Valencia* species from the Valenciidae EEP. This followed a workshop in Thessaloniki (Greece) on the same topic, with presentations given by Brian Zimmerman (TAG Chair) and collaborators from the Hellenic Centre for Marine Research.

ADDITIONAL COMMENTS

The article *Dramatic decline of two freshwater killifishes, main anthropogenic drivers and appropriate conservation actions* was published by Kalogianni, E. et al. in the Journal of Nature Conservation, building on the work of the Valenciidae EEP.

3 MARINE TELEOST

TAG Chair: Attila Varga (Sóstó Zoo, Nyíregyháza, Hungary)

INTRODUCTION

In 2022 several online and in person discussions took place, including the RCP workshop in October. As most of the marine teleost species kept in EAZA zoos and aquariums aren't currently threatened by extinction (although many of the IUCN Red List assessments are older than 10-15 years), the overall goals of the EAZA Marine Teleost TAG were identified to be different than those of most other TAGs: they are focused more on husbandry and the sustainability of aquarium populations.

Setting up a proper breeding system for marine teleost species in human care is challenging and requires significant investment from a public aquarium. To improve the breeding prospect, the TAG will support and encourage cooperation among aquariums, including the sharing of information about husbandry.

The RCP will be published in 2023.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

In aquariums, the collections of marine fish usually focus on only a few specific families (such as *Chromis sp.*). Additionally, many of these collections do not have complete records of all the species they hold.

During 2022, four online TAG meetings were organised in preparation for the RCP workshop. During these meetings, 11 fish families were assessed. In total, 22 species were pre-selected for the RCP.

The RCP workshop took place in October, jointly with the International Aquarium Congress 2022 (IAC) at Nausicaá (France). At the two-day workshop, 15 participants from nine different European countries attended and discussed the 22 pre-selected species. Of these, three will become new style EEPs, namely for the Banggai cardinalfish (*Pterapogon kauderni*), Long-snouted seahorse (*Hippocampus guttulatus*) and Short-snouted seahorse (*Hippocampus hippocampus*).

Detailed information about the species and a summary table are available on the TAG page of the Member Area.

The RCP workshop participants were in favour of creating working groups led by species champions for the rest of the species (or group of species) and to continue assessing other families that were not included in this RCP by sharing the workload and encouraging the discussion.

ACHIEVEMENTS DURING THE YEAR

Besides preparing the RCP, the 'Fish of the Year' campaign was discussed. Suggested by the TAG's Education Advisor team, the campaign's overall goal is to raise awareness of the marine environment through a unique 'flagship species' that will change each year. The Banggai cardinalfish was chosen for 'Fish of the Year 2023'. It is an EEP species with restricted distribution, decreasing population number, but high popularity among aquarists with a rather unique lifestyle. The Education Advisor team is working on the campaign information material that will be shared with the EAZA Members to use for free.

Spotted moray (*Gymnothorax isingteena*) © Zsuzsa Petró, Sóstó Zoo

COLLABORATIONS

The RCP meeting was held jointly with the IAC 2022, which provided a unique opportunity for the European Union of Aquarium Curators (EUAC), EAZA and many other organisations to further develop their collaborative relations.

The event also allowed for an informal meeting among experts from the public aquarium sector and livestock suppliers such as De Jong Marinelife (the Netherlands) and Flying Sharks (Portugal) to discuss shared concerns and future possibilities related to the public aquarium industry. During the discussion, several interesting and important tasks rose. For example, how by adopting responsible breeding practices, aquariums can demonstrate their commitment to environmental conservation and align themselves with the evolving values of an increasingly aware public. The meeting also highlighted the importance of the dialogue and cooperation between the public aquariums and the ornamental fish industry.

4 ELASMOBRANCH

TAG Chair: Max Janse (Royal Burgers' Zoo, Arnhem, the Netherlands)

INTRODUCTION

2022 was a year of compiling information for the EAZA Elasmobranch TAG. The RCP document was finalised and officially published. Two questionnaires were sent out, one on the conservation activities and one as a five-to-six-year population census of the *ex situ* population in Europe.

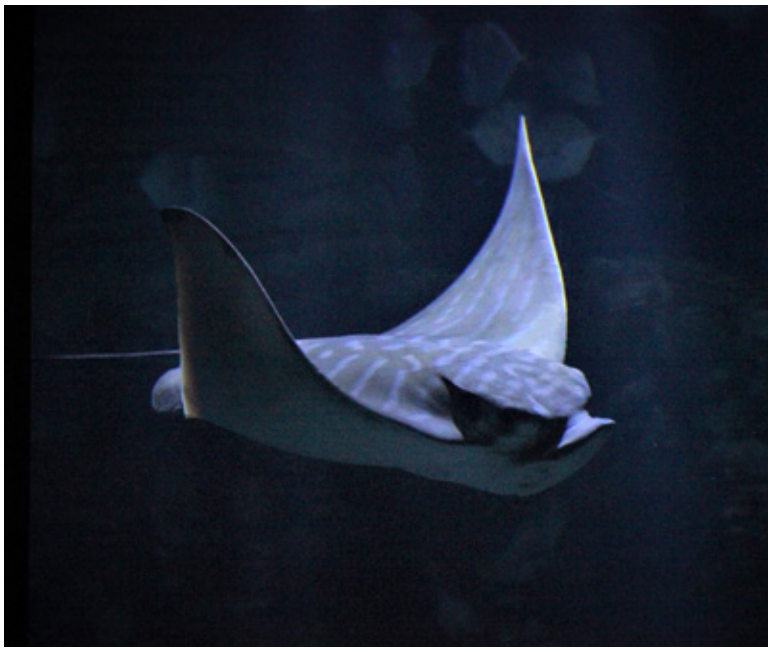
POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

After two online RCP workshops (in May and November 2021), where 62 elasmobranch species were assessed, an official RCP report was published in 2022 and agreed upon by the EEP Committee. The conclusion of the RCP is a list of 27 species to be managed at an EEP level.

For three species groups it was decided to have an EEP on a genus level: *Mustelus* spp. (including *Mustelus asterias* and *M. mustelus*), *Raja* and *Leucoraja* spp. (including *Raja brachyura, R. clavata, R. microocellata, R. montagui, R. radula, Leucoraja circularis* and *L. melitensis*) and *Pristis* spp. (including *Pristis pristis* and *P. zijsron*). The exception in *Raja* spp. is *Raja undulata* which will have a separate EEP.

The rest of the assessed species will be managed by the TAG as a MON-T. For four species (*Aetomylaeus bovinus*, *Galeorhinus galeus*, *Negaprion brevirostris* and *Pteroplatytrygon violacea*) and three genus groups (*Himantura* spp., *Orectolobus* spp. and *Rhinoptera* spp.), the MON-T will be managed by a 'species champion'.

Finally, three species received the status 'Do Not Obtain' (*Aetobatus narinari, Atelomycterus macleaya* and *Triakis scyllium*). It will be advised to work with similar species instead: *Aetobatus ocellatus, Atelomycterus marmoratus* and *Triakis semifasciata*.



Duckbill eagle ray (*Aetomylaeus bovinus*) © Carlos Taurá, Oceanogràfic Valencia

ACHIEVEMENTS DURING THE YEAR

In addition to the publication of the RCP, a Europe-wide elasmobranch census was conducted and sent to 215 European zoos and public aquariums. This was the third census done by the TAG. Usually it overviews a period of five years, but this time it focused on a six-year period. Many details were collected: the stock on the last day of the period (31 December 2021), whether it was a new species in the period, if the species reproduced, how many young were born/hatched during the period and their three-month survival rate.

The workload of the census was divided between the three European Regional Coordinators of the Sharks and Rays Project - an initiative of the Association of Zoos and Aquariums (AZA, USA) to facilitate a worldwide online census on *ex situ* populations (https://sharksandraysproject.com). Since this initiative did not give the complete picture, it was decided to conduct the above census.

Of the 215 zoos and aquariums, 127 answered (59,1%) with their stock overview. In total 135 species are kept, which included seven that were only defined up to the genus level. In the first half of 2023 further analyses need to be done as well as a comparison with the ZIMS data received on elasmobranchs as all EAZA Members are expected to have already entered their data in ZIMS.

Another achievement is the publication of the fourth Elasmobranch TAG News in February, which describes the latest activities of the TAG.

COLLABORATIONS

The TAG will continue to work towards the connections with the IUCN SSC Shark Specialist Group (SSG). Two representatives from the TAG are members of the Northern-European IUCN SSG and the IUCN SSG Public Aquarium Working Group. By establishing a further connection with members of the SSG the TAG will look for potential

ex situ conservation needs and actions and increase the collaboration with *in situ* conservation initiatives. The IUCN SSG Public Aquarium Working Group has defined their current roles as:

- Develop a Position Statement for the IUCN SSG on the role of zoos/aquariums in elasmobranch conservation
- Compile aquarium life history information for threatened (IUCN red-listed) elasmobranchs to inform conservation actions, with a focus on sawfish, wedge fishes, and freshwater stingrays
- Develop IUCN SSG Position Statement on *ex situ* elasmobranch release, rescue, and reintroduction based on IUCN One Plan Approach
- Develop IUCN SSG messaging and graphics on elasmobranch conservation for zoo/aquarium exhibits, outreach, and education programmes

CONSERVATION AND RESEARCH

Within the TAG a conservation focus group was created in 2021. They sent out a questionnaire to all 75 active partners within the Elasmobranch TAG programmes to gather information on the current conservation work and the areas where aquariums need to become more involved. Twenty-two aquariums answered, of which 50% were active in *in situ* conservation. Of these 11 aquariums, 64% were active as supporter and partner. The aquariums that were not yet active in conservation activities mentioned lack of time (n=5), and lack of resources and knowledge (n=6) as their main reasons. Of all participants, 82% of the aquariums were interested in getting involved in elasmobranch conservation initiatives in the future.

ADDITIONAL COMMENTS

A paper was published in Shark News, the IUCN SSC SSG's newsletter. It summarises the history of the Elasmobranch TAG and its current activities, with an overview of the managed species programmes. Also, the paper opened the doors for future collaboration with *in situ* initiatives.

In 2023 the RCP will be put into practice. A final report of the latest *ex situ* population census will be published and a result of the 2020 veterinary census will be given.

5 CORAL

Due to the current lack of Chair and Vice Chair in the EAZA Coral TAG, no report was submitted by the TAG for 2022.

6 JELLYFISH

TAG Chair: Hugo Batista (Oceanário de Lisboa, Lisbon, Portugal)

INTRODUCTION

This report aims to describe the latest work done within the EAZA Jellyfish TAG in 2022. During 2022, the Jellyfish database (that can be accessed through the website www.jellyfishtag.com) continued to be consulted and information about

Catostylus tagi currently exhibited at Oceanário de Lisboa © Pedro Pina

how to keep and produce different species of jellyfish was shared between institutions. New updates were made to the database, and information on the production and husbandry of *Catostylus tagi* was added.

ACHIEVEMENTS DURING THE YEAR

During 2022, requests for information on the production of different jellyfish species have increased compared to previous years. With the help of the database, the TAG has been a support to increase and facilitate the exchange of knowledge and animals between institutions.

A new guide about how to produce and keep *Catostylus tagi* was added to the database. It is the only species from the family Catostylidae present in Europe. This is the first time that the life cycle for this species was completed in laboratory condition, and the first time that these animals bred under human care are on display. This achievement was obtained by the team at Oceanário de Lisboa (Portugal).

The TAG attended the seventh meeting of GelAvista (https://gelavista.ipma.pt), a citizen science programme that acquires and treats data about jellyfish sightings on the coast of Portugal. A presentation on sharing information on jellyfish culture between public aquariums was made by the TAG. This presentation allowed us to bring the scientific community closer to the work that public aquariums can develop on jellyfish and engage with relevant stakeholders for this purpose.

COLLABORATIONS

We are happy to have jellyfish expert João Lopes (Oceanário de Lisboa) on board. He kindly wrote the guide for *Catostylus tagi*.

7 AMPHIBIAN

TAG Chair: Gerardo Garcia (Chester Zoo, Chester, United Kingdom) • TAG Vice Chairs: Olivier Marquis (Paris Zoo, Paris, France) and Benjamin Tapley (ZSL London Zoo, London, United Kingdom)

INTRODUCTION

There were no changes to the core membership of the EAZA Amphibian TAG (ATAG).

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

EAZA BPG were published for the black-eyed leaf frog (*Agalychnis moreletii*); the management of which has been transferred from Chester Zoo (UK) to Paris Zoo (France). The BPG for aquatic caecilians were also updated.

A RCP workshop for dendrobatid frogs was held in 2022 and the report will be published in 2023. The LTMPs for the Mountain chicken frog and the Montseny brook newt EEPs were completed.

ACHIEVEMENTS DURING THE YEAR

Aquazoo Düsseldorf (Germany) published a book entitled *111 Amphibians that improve our world every day*; 100% of the royalties go to amphibian projects through the Amphibian Fund of the Association of German-speaking Zoological Gardens (VdZ) Species Conservation Foundation. In addition, the zoo bred nine species of amphibian including European treefrogs (*Hyla arborea*) for the first time.

Chester Zoo received a new group of Montseny brook newt (*Calotriton arnoldi)* from the eastern population as part of the EEP for this Critically Endangered species. They were housed in biosecure facilities, in the first Centre for Environment, Fisheries and Aquaculture Science (CEFAS)-approved quarantine facility for Caudata since importation regulations changed post-Brexit. In an EAZA first, the team at Chester Zoo bred and reared the Asian river toad (*Phrynoidis asper*).

The Borneo pygmy toad (*Ingerophrynus divergens*) reproduced for the first time in Cologne Zoo (Germany). The zoo also achieved a zoo first breeding of the Mayotte frog (*Blommersia transmarina*). Thomas Ziegler, Aquarium Curator at the zoo, was included in the top 50 list of internationally leading zoologists as part of the Blooloop Zoo and Aquarium Influencer List 2022.

COLLABORATIONS

Collaborations started for the action planning for *Leptodactylus fallax* by Jersey Zoo (UK), Chester Zoo, ZSL London Zoo (UK), Nordens Ark (Sweden) together with local and regional partners and continued for the research into chytrid mitigation options under semi-natural conditions on Montserrat.

Münster Zoo (Germany) and Cologne Zoo are collaborating with Citizen Conservation (Germany) for conservation breeding of amphibians together with private holders.

CONSERVATION AND RESEARCH

Vienna Zoo (Austria) investigated the behavioral ventilation in the Lake Titicaca frog (*Telmatobius culeus*). In collaboration with Brown University and Smith College (USA) they also explored the influence of androgens on the visual and acoustic display of anurans. In collaboration with the Federal States of Austria and University of Veterinary Medicine Vienna (Austria), the zoo continued the long-term surveillance of *Batrachochytrium salmanadrivorans* in local amphibians. Finally the zoo is supporting a PhD study looking at ontogenetic colour change in anurans.

Jersey Zoo supported a study into phylogenetics of amphibians and completed a second population survey for two Critically Endangered frogs in Ambohitantely National Park (Madagascar). Their annual head-starting project for agile frogs (*Rana dalmatina*) saw 4,554 tadpoles released.

AQUATIS Aquarium-Vivarium (Switzerland) has a funding to rescue a population of alpine newts (*Ichthyosauria alpestris inexpectata*) from Italy in collaboration with the Department of Biology, Ecology and Earth Science of Della Calabria University and the Regional Museum of Natural Science of Torino (both Italy).

In addition to the release of *Calotriton arnoldi* bred in human care, Chester Zoo toured newt facilities at Barcelona Zoo and the breeding centre at Torreferrussa (both Spain) and discussed the future of the project with partners from the Government of Catalonia and Barcelona Zoo, including Francesc Carbonell, EEP Coordinator for the species. Chester Zoo in collaboration with Liverpool John Moores University (UK) is also undertaking audiological research on golden mantellas (*Mantella aurantiaca*). They will assist as well in a study on the genetics of achoque (*Ambystoma dumerilii*) and in the release of 46 juveniles by the University of Michoacan (Mexico) into a pond created by the edge of Lake Patzcuaro.

Chester Zoo staff participating in an experimental release of 46 achoque juveniles (*Ambystoma dumerilii*) © J. Javier Alvarado Diaz, Laboratorio de Biologia Acuatica

Terrariet Reptile Zoo staff and local school children releasing natterjack toads (*Epidalea calamita*) at Helnæs Maden, Funen, Denmark © Sarah Vig Hansen

Nordens Ark released more than 60,000 European green toads (*Bufotes viridis*) in 2022. In collaboration with the County Administrative Board of Kalmar County on the Baltic Island Öland (Sweden), they launched a new citizen science project to gather observations of this species. The team also initiated a project to train dogs to locate green toads in the wild and they published research on improved management of *Leptodactylus fallax.*

Paris Zoo initiated field surveys and habitat descriptions of two painted mantella (*Mantella baroni*) populations in the Vohimana Reserve (Madagascar). They are financially supporting a population genetics study of the remaining populations of Cowan's matella (*Mantella cowanii*) in Madagascar, a recommendation of the action plan launched in 2021.

Copenhagen Zoo (Denmark) released natterjack toads (*Epidalea calamita*: 36,149 tadpoles and 135 toadlets), *Bufotes viridis* (78,999 tadpoles and 149 toadlets) and European fire-bellied toads (*Bombina bombina*: 2,715 tadpoles and 71 froglets).

Terrariet Reptile Zoo (a Danish non-EAZA EEP participant) continued a long-term monitoring programme for *Epidalea calamita* and reported a large population decrease at one site. In response, 100 toadlets were released there.

Cologne Zoo released 218 young *Bufotes viridis* into the wild in support of the local green toad population.

Zürich Zoo (Switzerland) in partnership with Cali Zoo (Colombia) and WCS Colombia undertook the first reintroduction for the breed-to-release colony of Critically Endangered Lehmann's poison frog (*Oophaga lehmanni*). Zürich Zoo successfully bred tomato frogs (*Dyscophus antongilii and D. gueneti)* and several dendrobatid frogs (*Oophaga anchicayensis*) and the golden poison frog (*Phyllobates terribilis*).

ZSL London Zoo contributed to Red List and Green Status assessments of south-east Asian amphibians and supported Asian and Latin American EDGE Fellows working on Charles Darwin's frog (*Minervarya charlesdarwini*), Bostford's leaf-litter frog (*Leptobrachella botsfordil;* discovering a new population) and nimble long-limbed salamanders (*Nyctanolis pernix*). They collaborate with Green Camel Bell (China) on Chinese giant salamander (*Andrias davidianus*) conservation in China. They also published research on improved management of Lake Oku frogs (*Xenopus longipes*) and *Leptodactylus fallax*.

ADDITIONAL COMMENTS

Members of the TAG were involved in the following publications:

- Ævarsson, U. et al. (2022). *Individual identification of the Lake Oku clawed frog (Xenopus longipes) using a photographic identification technique*. Herpetological Conservation and Biology, 17: 67-75
- Bates, K. et al. (2022). *Microbiome function predicts amphibian chytridiomycosis disease dynamics*. Microbiome, 10: 44
- Anderson, N. K. et al. (2022). *Activational vs. organizational effects of sex steroids and their role in the evolution of reproductive behavior: Looking to foot-flagging frogs and beyond.* Hormones and Behavior, 146: 105248
- Bradfield, K., Tapley, B. and Johnson, K. (2022). *Amphibians and conservation breeding programmes: how do we determine who should be on the ark?* Biodiversity and conservation, 1-14
- Dias, J. E. et al. (2022). *Baseline behavioural data and behavioural correlates of disturbance for the Lake Oku clawed frog (Xenopus longipes).* Journal of Zoological and Botanical Gardens, 3: 184-197
- Hoang, C. V. et al. (2022). *Distribution pattern of the* Microhyla heymonsi group (Anura, Microhylidae) with descriptions of two new species from Vietnam. European Journal of Taxonomy, 846: 1-4
- Krzikowski, M. et al. (2022). *Assessment of the threat status of the amphibians in Vietnam - Implementation of the One Plan Approach*. Nature Conservation, 49: 77-116
- Lo, N. T. et al. (2022). *First record of Leptobrachella shiwandashanensis Chen, Peng, Pan, Liao, Liu & Huang, 2021 (Anura: Megophryidae) from Vietnam*. Journal of Forestry Science and Technology, 14: 28-32
- Lötters, S. et al. (2022). *The gastromyzophorous tadpole of the pink harlequin frog from Suriname with comments on the taxonomy of Guianan Clade Atelopus (Amphibia, Bufonidae)*. Zootaxa, 5087(4): 591-598
- Luong, A. M. et al. (2022). *A new species of Xenophrys (Amphibia: Anura: Megophryidae) from Truong Son Range, Vietnam*. Zootaxa, 5150 (3): 333-356
- Michaels, C. J. et al. (2022). *Sexually dimorphic growth and maturity in captive mountain chicken frogs (Leptodactylus fallax)*. Herpetological Bulletin, 161: 12-15

- Ngo, H. N. et al. (2022). *The herpetofauna of Hon Khoai Island, Ca Mau Province, Vietnam*. Biodiversity Journal, 13(1): 3-17
- Nguyen, L. T., Tran, D. T. Y. and Tapley, B. (2022). *The advertisement call of the Indochinese brown bullfrog, Kaloula indochinensis Chan, Blackburn, Murphy, Stuart, Emmett, Ho and Brown, 2013 (Anura: Microhylidae) from Gai Lai Province, Vietnam.* Management of Forest Resources and Environment, 14: 21-27
- Nguyen, L. T. et al. (2022). *The first records of Limnonectes kohangae (Smith 1922) and Sylivirana mortenseni (Boulenger 1903) from Phu Quoc Island, southern Vietnam. Management of Forest Resources and Environment*. Management of Forest Resources and Environment, 14: 34-39
- Ninh, H. T. et al. (2022). *A new species of mossy frog (Anura: Rhacophoridae) from Northeastern Vietnam*. European Journal of Taxonomy, 794: 72-90
- Pham, A. V. et al. (2022). *New records of amphibians from Son La Province, Vietnam*. Herpetology Notes, 15: 169-178
- Pham, C. T. et al. (2022). *Hidden in the jungle of Vietnam: a new species of Quasipaa (Amphibia, Anura, Dicroglossidae) from Ngoc Linh Mountain*. ZooKeys, 1124: 23-42
- Pham, C. T. et al. (2022). *First record of Limnonectes fastigatus Stuart, Schoen, Nelson, Maher, Neang, Rowley & McLeod, 2020 (Anura: Dicroglossidae) from Vietnam*. Academia Journal of Biology, 44(1): 115-121
- Servini, F. et al. (2022). *Captive observations of multiple clutching in Leptodactylus fallax Müller, 1926*. Herpetological Bulletin, 159: 25-28
- Stückler, S. et al. (2022). *Carotenoid intake during early life mediates ontogenetic colour shifts and dynamic colour change during adulthood*. Animal Behaviour, 187: 121-135
- Stückler, S., Fuxjager, M. J. and Preininger, D. (2022). *Evidence that catecholaminergic systems mediate dynamic colour change during explosive breeding events in toads*. Biology Letters, 18: 20220337
- Ziegler, T. (2022). *Praxis bei der Umsetzung des „One Plan Approach" in der Zusammenarbeit mit Südostasien*. Verhandlungsbericht 0. Rigi-Symposium. Visionen für einen erfolgreichen Naturschutz. Rigi-Kulm, 27. bis 29. Januar 2022, zooschweiz / zoosuisse, Bern, 29-33
- Ziegler, T. (2022). *The IUCN's One Plan Approach and the role of progressive zoos in conservation: case studies from herpetology*, Riassunti / Abstracts, Plenary lecture, XIV Congresso Nazionale, Societas Herpetologica Italica, 13-17 settembre 2022 - Torino, 17-18
- Ziegler, T. et al. (2022). *Threatened Malagasy amphibians and reptiles in zoos – a call for enhanced implementation of the IUCN's One Plan Approach*. Der Zoologische Garten, 90: 21-69
- Ziegler, T. et al. (2022). *A taxonomic update 20 years after the book release "The amphibians and reptiles of a lowland forest reserve in Vietnam" - Ho Ke Go: Implications for conservation*. Academia Journal of Biology, 44(3): 111-132
- Ziegler, T., Rauhaus, A. and Niggemann, C. (2022). *50 Jahre Terrarienabteilung des Kölner Aquariums: Auf dem Weg zum Artenschutz-Zoo. Teil 4: Artenschutz in der Praxis*. Reptilia Nr. 153, 27(1): 44-55
- Ziegler, T. et al. (2022). *Zusammen für die Wechselkröte (Bufotes viridis) – Ein „One Plan Approach"-Schutzprojekt vor den Toren des Kölner Zoos*. Elaphe, 4, Titelthema: 28-39.

8 REPTILE

TAG Chair: Ivan Rehák (Prague Zoo, Prague, Czechia) • Vice Chairs: Ivan Cizelj (Zagreb Zoo, Zagreb, Croatia), Matt Goetz (Jersey Zoo, Jersey, United Kingdom), Fabian Schmidt (Basel Zoo, Basel, Switzerland) and Guido Westhoff (Hagenbeck Zoo, Hamburg, Germany)

INTRODUCTION

In 2022, the EAZA Reptile TAG (RTAG) consisted of 39 members and three Advisors. It maintained 25 EEPs and 23 ESBs, with a wide geographical representation of participating zoos.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

The year 2022 brought significant progress in the development of reptile population management in the EAZA community. The RCP for Crocodiles was approved and the RCP workshop for lizards was successfully held. Two new EEPs for the Asian river terrapins (genus *Batagur*) and the Yellow-headed tortoise (*Indotestudo elongata*) were approved. The ESBs for Giant Malaysian turtle (*Orlitia borneensis*) and Spiny hill turtle (*Heosemys spinosa*) were 'upgraded' to new style EEPs. LTMPs were published by the Galapagos giant and the Pancake tortoise EEPs. The Best Practice Guidelines for sand lizard (*Lacerta agilis*) were approved.

ACHIEVEMENTS DURING THE YEAR

In 2022, the RTAG had a joint mid-year meeting with the Amphibian TAG and the annual meeting was held during the EAZA Annual Conference. Other meetings and workshops were organised including the 2nd Meier Symposium for the Conservation of Endangered Chelonians in Münster Zoo (Germany) and the International Gharial (*Gavialis gangeticus*) Day in Prague Zoo (Czechia).

The RTAG also provided EAZA representatives for the 19th meeting of the CITES Conference of the Parties in Panama with expert comments to proposals relating to reptile species.

Chester Zoo (UK) conducted the first trial release of Bermuda skinks (*Plestiodon longirostris*) bred in human care back to the wild. The juveniles of the West African crocodile (*Crocodylus suchus*), born in AQUATIS Aquarium-Vivarium (Switzerland), will be transferred to the zoo in Abidjan (Ivory Coast), for their translocation into the wild. Jersey Zoo (UK), EEP Coordinator for the Ploughshare tortoises (*Astrochelys yniphora*), constructed an initial 8-ha-long security fence enclosure at Baly Bay (Madagascar), for the future release of these Critically Endangered tortoises back into their native habitat.

In 2022, several new exhibits were built: the Turtle Ark in Nordens Ark (Sweden) - a breeding centre for 14 species of the world's most endangered turtle species; the new conservation exhibit with a focus on Critically Endangered species of turtles and lizards in Münster Zoo (Germany); a new stand-alone exhibit dedicated for Aldabra giant tortoises (*Aldabrachelys gigantea*) in Jersey Zoo.

Endangered lance-nosed chameleon (*Calumma gallus*) discovered during the survey in the Vohimana reserve in Madagascar © Gagah

COLLABORATIONS

Jersey Zoo, Studbook keeper for the Lesser Antillean iguana (*Iguana delicatissima*), is collaborating with the IUCN Iguana SG and local partners of all Lesser Antillean islands in conservation actions for this species.

In March-April 2022, Chester Zoo's Deputy Curator and RTAG member Iri Gill visited Fauna & Flora International's Phnom Tamao crocodile breeding centre in Vietnam to advise on their husbandry of the Critically Endangered Siamese crocodile (*Crocodylus siamensis*). In April, the Lao Conservation Trust for Wildlife was able to put together a group of Siamese crocodiles, which the team of Cologne Zoo (Germany) had previously examined for genetic purity for the establishment of conservation breeding.

The *Mauremys* spp. EEP continued to work with the Spanish authorities in its ongoing support with large turtle seizure and prepared the moving of first turtles out of the rescue centre to EEP designated holders.

Münster Zoo – in which the centre for conservation of turtles is based and the *Cuora* spp. I and II EEPs are coordinated – collaborated in research and conservation issues with other partners such as Senckenberg Museum Dresden (Germany) for genetic screening of these species, Wildlife Conservation Society Cambodia on the *Batagur* project and *Indotestudo* project, or University Münster (Germany) for a turtle behaviour project.

ZSL London Zoo (UK) continued to work with the Asian Turtle Programme in Vietnam in the development of rehabilitation and rescue protocols for big-headed turtles (*Platysternon megacephalum*) seized from the illegal wildlife trade.

Zagreb Zoo (Croatia) is one of partners of the four-year EU LIFE programme conservation project "Life for *Mauremys*" focused on conservation of the Balkan terrapin (*Mauremys rivulata*) and launched in 2022.

CONSERVATION AND RESEARCH

The Komodo dragon EEP in partnership with Komodo Survival Programme conducted a population monitoring programme.
Jersey Zoo continued field research on the newly described endemic Montserrat iguana (*Iguana melanoderma*).
The Cuban boa ESB coordinated molecular research to re-evaluate the management measures for the species' *ex situ* population.

Paris Zoo initiated a radio tracking project of the tree boa *Corallus hortulanus* in French Guiana and a chameleon species survey in the Vohimana reserve in Madagascar.

ZSL London Zoo is supporting a new EDGE Fellow working to conserve the Mount Kenya bush viper (*Atheris desaixi*) and the Kenya horned viper (*Bitis worthingtoni*).

Cologne Zoo continued with research and conservation projects in Vietnam, Laos and Philippines.

Münster Zoo implemented a follow-up project on water snakes in Cambodia and started reintroduction programmes for *Indotestudo elongata* and *Cuora amboinensis.*

Universeum (Sweden) has donated money to Plato Negro Ecology and Conservation, who conducts fieldwork for conservation of the black-headed bushmaster (*Lachesis melanocephala*).

ADDITIONAL COMMENTS

Members of the RTAG supervised several student theses in 2022. They were also involved in the following publications:

- Antonelli, A. et al. (2022). *Madagascar's extraordinary biodiversity: Evolution, distribution, and use.* Science, 378: 1-9
- Bobek, M. and Rehák, I. (2022). *Notes on reptiles traded in bushmeat markets in Central Africa.* Gazella (Praha), 47-48, 2020-2021 [2022]: 62-79
- Çilingir, G. E. et al. (2022). *Chromosome-level genome assembly for the Aldabra giant tortoise enables insights into the genetic health of a threatened population*. GigaScience, 11: 1-14
- Cook M., Williams, L. J. and Gill, I. (2022). *Reproductive husbandry of the rat snake Elaphe moellendorffi.* Herpetological Bulletin, 159: 1-5
- Cox, N. et al. (2022). *Global reptile assessment reveals commonality of tetrapod conservation needs.* Nature, 605: 285-290
- Dinh, T. S. et al. (2022). *New country record of Trimerodytes yapingi (Guo, Zhu & Liu, 2019) (Squamata: Natricidae) from Laos with the first description of a male specimen and expanded diagnosis.* Bonn Zoological Bulletin, 71(2): 99-103
- Ha, N. V. et al. (2022). *A new species of the genus Achalinus (Squamata: Xenodermidae) from Son La Province, Vietnam.* Zootaxa, 5168 (3): 375-387
- Dollion, A. Y. et al. (2022). *Do male panther chameleons use different aspects of color change to settle disputes?* The Science of Nature, 109(13): 1-14
- English, M. et al. (2022). *A dry season glimpse of watersnake bycatch and trade from the flooded forests of Kampong Khleang, Tonlé Sap Lake*. Cambodian Journal of Natural History, 2022(1): 38-46
- Fieschi-Méric, L. et al. (2022). *An improvement in enclosure design can positively impact welfare, reduce aggressiveness and stabilise hierarchy in captive Galapagos giant tortoises.* Journal of Zoological and Botanical Gardens, 3: 499-512
- Karameta, E. et al. (2022). *The story of a rock-star: multilocus phylogeny and species delimitation in the Starred or Roughtail rock Agama, Laudakia stellio (L., 1758)*. Zoological Journal of the Linnean Society, 195(1): 195-219
- Marques, M. P. et al. (2022). *All in all it's just another branch in the tree: A new species of Acanthocercus Fitzinger, 1843 (Squamata: Agamidae), from Angola*. Zootaxa, 5099: 221-243
- Ngo, H. T. et al. (2022). *How many more species are out there? Current taxonomy substantially underestimates the diversity of bent-toed geckos (Gekkonidae, Cyrtodactylus) in Laos and Vietnam*. ZooKeys, 1097: 135-152
- Ngo, H. N. et al. (2022). *Ecological niche overlap of two allopatric karst-adapted tiger geckos (Goniurosaurus) from northern Vietnam: microhabitat use and implications for conservation*. Journal of Natural History, 56, 37-40: 1495-1511
- Ngo, H. N. et al. (2022). *Living under the risk of extinction: population status and conservation needs assessment of a micro–endemic tiger gecko in Vietnam.* Animal Biodiversity and Conservation, 45(2): 175-188
- Ngo, H. N. et al. (2022). *The herpetofauna of Hon Khoai Island, Ca Mau Province, Vietnam*. Biodiversity Journal, 13(1): 3-17
- Nguyen, T. T. et al. (2022). *Molecular phylogenetic analyses and ecological niche modeling provide new insights into threats to the endangered Crocodile Lizard (Shinisaurus crocodilurus).* Frontiers of Biogeography, 14(1): e54779
- Ralimanana, H. et al. (2022). *Madagascar's extraordinary biodiversity: Threats and opportunities*. Science, 378: eadf1466
- Rehák, I. et al. (2022). *Origin and haplotype diversity of the northernmost population of Podarcis tauricus (Squamata, Lacertidae): Do lizards respond to climate change and go north?* Biodiversity Data Journal, 10: e82156
- Rehák, I. et al. (2022). *A deep divergence and high diversity of mitochondrial haplotypes in an island snake: the case of Chilabothrus angulifer (Serpentes: Boidae).* Acta Societatis Zoologicae Bohemicae, 85: 1–22
- Ribeiro-Júnior, M. A. et al. (2022). *Taxonomic revision of the Tropiocolotes nattereri (Squamata, Gekkonidae) species complex, with the description of a new species from Israel, Jordan and Saudi Arabia*. Zoologica Scripta, 1-22
- Passos, L. F., Garcia, G. and Young, R. (2022). *Flashy male Jamaican anoles Anolis grahami show accelerated telomere attrition*. Herpetological Journal, 32 (2): 80-84
- Schmidt, F., et al. (2022). *Regional Collection Plan – Crocodylia - for the EAZA Reptile Taxon Advisory Group – Edition One*. EAZA Executive Office, Amsterdam
- van Schingen-Khan, M. et al. (2022). *Will climatic changes affect the Vietnamese crocodile lizard? Seasonal variation in microclimate and activity pattern of Shinisaurus crocodilurus vietnamensis.* Amphibia-Reptilia, 43(2): 155-167
- Williams, I. J. et al. (2022). *Activity patterns and reproductive behaviour of the Critically Endangered Bermuda skink (Plestiodon longirostris)*. Zoo Biology,2022: 1-8
- Ziegler, T. (2022). *Praxis bei der Umsetzung des „One Plan Approach" in der Zusammenarbeit mit Südostasien. Verhandlungsbericht 0. Rigi-Symposium. Visionen für einen erfolgreichen Naturschutz*. Rigi-Kulm, 27. bis 29. Januar 2022, zooschweiz / zoosuisse, Bern, 29-33
- Ziegler, T. (2022). *The IUCN's One Plan Approach and the role of progressive zoos in conservation: case studies from herpetology*. Riassunti / Abstracts, Plenary lecture, XIV Congresso Nazionale, Societas Herpetologica Italica, 13-17 settembre 2022 - Torino, 17-18
- Ziegler, T. et al. (2022). *Threatened Malagasy amphibians and reptiles in zoos – a call for enhanced implementation of the IUCN's One Plan Approach*. Der Zoologische Garten, 90: 21-69
- Ziegler, T. et al. (2022). *A taxonomic update 20 years after the book release "The amphibians and reptiles of a lowland forest reserve in Vietnam"- Ho Ke Go: Implications for conservation*. Academia Journal of Biology, 44(3): 111-132
- Ziegler, T. and Rauhaus, A. (2022). *Vietnamese Tiger Gecko Research and Conservation Breeding Projects at the Terrarium Section of Cologne Zoo, Germany*. Ratel, 48 (3): 5-10
- Ziegler, T. and Rauhaus, A. (2022). *Vietnamesische Tigergeckos – Forschungs- und Erhaltungszuchtprojekte des Kölner Zoos*. Arbeitsplatz Zoo, 33(1): 28-37
- Ziegler, T., Rauhaus, A. and Niggemann, C. (2022). *50 Jahre Terrarienabteilung des Kölner Aquariums: Auf dem Weg zum Artenschutz-Zoo. Teil 4: Artenschutz in der Praxis*. Reptilia, Nr. 153, 27(1): 44-55
- Zimin, A. et al. (2022). *A global analysis of viviparity in squamates highlights its prevalence in cold climates*. Global Ecology and Biogeography, 31: 2437-2452

9 RATITE

TAG Chair: Joost Lammers (Avifauna Birdpark, Alphen aan den Rijn, the Netherlands) • Vice Chair: Zoe Sweetman (Chester Zoo, Chester, United Kingdom)

INTRODUCTION

The EAZA Ratite TAG encompasses all species of *Palaeognath* birds, which includes ostriches, rheas, cassowaries, emus, kiwis and tinamous. The TAG was established in 2008 with the mission to facilitate the management of ratites and tinamous in EAZA collections and to participate in and support relevant conservation efforts.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

Zoe Sweetman (Chester Zoo, UK) was approved as new Vice Chair in April. This position had been vacant since Jo Gregson (Paignton Zoo, UK) retired from her job in 2020.

The TAG is pleased to announce that a new Studbook keeper was found in 2022 for the Lesser rhea ESB – a position vacant since Peter Smallbones (Paignton Zoo, UK) stepped down in early 2021. Stephan Rijnen (Dierenrijk, the Netherlands) took on this important role from late April on.

The brown kiwi (*Apteryx mantelli*) is always managed under the umbrella of an AZA Species Survival Plan (SSP), coordinated by Kathleen Brader (Smithsonian National Zoo, USA). The SSP contains all birds outside New Zealand, including the ones in EAZA zoos. Since AZA is considerably changing its population management structure, this programme will become a Studbook without access to the Population Management Centre. Kathleen Brader will continue to manage it as it is for the time being, but a renewed discussion to eventually start an EEP for the species seems justified at this stage.

The original RCP workshop scheduled for 2023 is postponed to 2024.

ACHIEVEMENTS DURING THE YEAR

A TAG meeting was held in April during the online Bird TAGs meeting. After a brief introduction of the TAG Chair, the new Vice Chair introduced herself and her cassowary research. This was followed by three interesting talks. Anthony Dabadie (Parc Animalier de Branféré, France) talked about their new enclosure planning for Southern cassowaries (*Casuarius casuarius*) and the first bird transport. Sam Gray (Paignton Zoo, UK) then presented Problem Solving and Managing Change in this species. Finally, Casey Povey's (Chester Zoo) presentation was on Rearing the elegant crested tinamou (*Eudromia elegans*) at Chester Zoo.

CONSERVATION AND RESEARCH

The brown kiwi SSP was approached by Rebecca Conor, PhD student from Waikato University in New Zealand, to contribute to a study on the effect of management on the welfare and behaviour of kiwis in human care. All AZA and EAZA brown kiwi holders were contacted and almost all cooperated with the research. A final report is expected in 2023.

Collecting samples for the research project on improving conservation breeding and management of Southern cassowary (*Casuarius casuarius*) © Chester Zoo

A Master's Research project on Improving *ex situ* conservation breeding and management of Southern cassowary started in 2022. The aim of this research is to gain a comprehensive understanding of the species' reproductive behaviour, including the role that vocalisations play within their courtship, and to understand the hormonal mechanisms that influence courtship behaviour. This increased understanding of Southern cassowary behaviour will improve welfare and husbandry standards across EAZA zoos. Following the completion of this research, BPG for this species will be written. This is to enable keepers to understand the cues and signals for breeding (through behaviour and reproductive hormones) and for them to confidently mix and separate these solitary and territorial birds at the correct times to avoid any undesired aggression between individuals. In addition to hopefully reduce undesirable aggression, this will also increase compatibility and breeding successes each year.

The four main objectives of this research are as follows:

- Make a detailed description of the behavioural context prior, during and after courtship and mating of Southern cassowaries, closely documenting the behavioural cues that may facilitate pairing
- Document and analyse males and female Southern cassowary vocalisations in relation to breeding
- Analyse faecal reproductive hormone concentrations across a number of breeding and non-breeding male and female Southern cassowaries
- Summarise current husbandry and management of Southern cassowary across EAZA collections

All EEP holders for the species were contacted with a request to get involved in the project. A fantastic response has been seen so far. 2023 will see this information collated and then disseminated to all EEP holders for the Southern cassowary.

10 PENGUIN

TAG Chair: Pierre de Wit (WILDLANDS Emmen, Emmen, the Netherlands) • Vice Chair: Craig Allum (Selwo Marina, Málaga, Spain)

INTRODUCTION

The EAZA Penguin TAG held an open meeting at the EAZA Annual Conference in Albufeira, Portugal. This was the first in-person meeting held since 2019 due to the COVID-19 outbreak. The major developments in the different programmes were discussed.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

At the end of 2022, the total living population of Humboldt penguin (*Spheniscus humboldti*) comprised of 2,575 birds. Despite this high number, in general, there is still a high demand for birds within EAZA. Over the year, 321 Humboldt penguins hatched, of which 60% were still alive at the end of the year. In 2022, 229 adult birds died for various reasons. Investigating health issues, especially infectious diseases, is part of the actions mentioned in the LTMP for the species. Sixty birds were transported between eight EAZA institutions.

The African penguin (*Spheniscus demersus*) population remained stable around 2,200 birds in 2022. A few institutions showed a high breeding success. The EEP is in contact with the EAZA Population Management Centre team to establish a LTMP for the species.

The population of the Magellanic penguins (*Spheniscus magellanicus*) remained stable at 110 birds. The LTMP for this new programme will be finished at the beginning of 2023.

Since 2007, the population size of the Northern rockhopper penguin (*Eudyptes moseleyi*) has steadily increased thanks to an increasing annual hatch rate. The population size was 137 birds at the end of 2022.

The population of the Southern rockhopper penguin (*Eudyptes chrysocome*) will very likely decline in the following years if the number of broods cannot be further increased. By the end of 2022, a total of 78 birds were held in four institutions, with five successful offspring that year. The Eastern rockhopper penguin subspecies (*Eudyptes chrysocome filholi*) is present in two facilities. At the end of 2022 these facilities together kept 36 birds.

The King penguin (*Aptenodytes patagonicus*) population at the end of 2022 was at 317 (175.132.10) with over 20 holders. Jo Elliot (Edinburgh Zoo, UK) stepped down in her capacity as the EEP Coordinator and was succeeded by her Edinburgh colleague, Michael Livingstone. A new Species Committee was elected in 2022 which includes six members and a new Veterinary Advisor.

The ESB for Gentoo penguin (*Pygoscelis papua*) was changed into a new style EEP. The total population at the end of 2022 counted 857 individuals (389.439.29), within 30 different institutions and consisted of three distinct subspecies:

- Falkland gentoo *(P. papua papua*): 189 animals (90.94.5) in six institutions, three of them only presenting this subspecies
- Antarctic peninsula gentoo (*P. papua ellsworthi*): 44 animals in nine institutions (20.21.3)

P. papua (subspecies uncertain, currently managed as *P. p. ellsworthi*, maybe proposed new *P. p. poncetii* (South Georgia gentoo): 557 animals in 24 institutions (251.297.9)

There were 60 hatches at 12 institutions, of which 42 survived.

The EEP has welcomed two new holders and more Gentoo penguins are available for new holders.

Gentoo penguin (*Pygoscelis papua*) at Selwo Marina © Craig Allum

African penguins (*Spheniscus demersus*) at Artis Zoo
© Ronald van Weeren

COLLABORATIONS

In 2022, the Penguin TAG continued to be in close contact with the Zoo and Aquarium Association (ZAA) in Australasia about the possibility of importing little penguins (*Eudyptula minor*) in the future. Australia has limited the space available for continuous breeding so a transfer to the EAZA region may assist in this regard. ZAA is currently aiming towards an export in 2024. This way, ZAA members can breed the birds to the requirements. Those EAZA institutions interested to start with the species were provided with the husbandry requirements by the TAG.

CONSERVATION AND RESEARCH

As stated in previous annual reports, the Penguin TAG does not directly support conservation work but highlights the work of its members. In this context it encourages the holders to educate the public about the status of penguins, the threats specific species and penguins in general face, the need for conservation actions whilst asking the question "How can we help?".

In the African penguin EEP, many participants continued sponsoring the Southern African Foundation for the Conservation of Coastal Birds (SANCCOB). The results of a research project about the moult of African penguins were shared with the holders as well as SANCCOB.

The Penguin TAG took part in a call amongst EAZA to participate in a petition - initiated by Sphenisco (Germany) and Alianza Humboldt (Chile) - aimed at the prevention of the construction of a high-grade iron and copper open pit mine and port at the heart of the Humboldt archipelago (Chile) ecosystem. Already in 2017, "Project Dominga" had been rejected by the Committee of Ministers. This was followed by a lawsuit filed by the company Andes Iron, which went through various courts, and in the end was passed back to the Minister's Committee for a decision, which is expected at the beginning of 2023.

The conservation fund of Augsburg Zoo (Germany) funded the Magellanic penguin project from the Center for Ecosystem Sentinel at the University of Washington (USA) in Punta Tombo with € 30,000.

ADDITIONAL COMMENTS

A baseline document was produced for the BPG for all species of penguin, to be published in 2023/24.

11 CICONIIFORMES AND PHOENICOPTERIFORMES

TAG Chair: Catherine King (Lagos Zoo, Lagos, Portugal) • TAG Vice Chair: Andrea Bračko (Zagreb Zoo, Zagreb, Croatia)

INTRODUCTION

In 2022, the EAZA Ciconiiformes and Phoenicopteriformes TAG had to deal with the appearance of deadly strain(s) of avian influenza across Europe that has been impacting wild and *ex situ* populations of some waterbirds. Waterbirds are particularly susceptible to avian influenza, and their management had to be altered in many EAZA zoos to limit their risk of exposure in 2022.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

The ESB for the Puna ibis (*Plegadis ridgewayi*) was impacted by avian influenza when an important group of 10 birds, nesting and with chicks, had to be culled. Nonetheless, four other institutions had good breeding success and the Studbook keeper, Emile Prins (GaiaZOO, the Netherlands) was pleased to report that despite this setback the population grew from 102 birds to 105 birds in 2022.

ACHIEVEMENTS DURING THE YEAR

The TAG began its quest to compile videos and photos that will help colleagues better manage their species. The first undertaking was to gather documentation of zoos catching and handling flamingos, as this is a challenging management procedure for which zoo staff routinely ask for suggestions on how to proceed (see conservation and research section). We were pleased to receive documentation from several zoos, including Bioparc Fuengirola (Spain), Serengeti-Park Hodenhagen (Germany), Zoo de la Palmyre (France), and Zürich Zoo (Switzerland). Staff from other zoos indicated they will send documentation as well.

The TAG meeting held in September included a presentation by Indra Prasad Acharja (Royal Society for Protection of Nature, RSPN, Bhutan) about conservation of the Critically Endangered white-bellied heron (*Ardea insignis*) in Bhutan. The TAG, together with several zoos, particularly Prague Zoo

and Zlín-Lešná Zoo in Czechia and Warsaw Zoo (Poland) have provided advice, training and some financial support for the breeding of this species under human care. Additional funding is needed to make more enclosures at the breeding centre, and Alicia Pérez (Logical Zoo, Spain) presented architectural drawings made pro bono by the company for potential future enclosures and their arrangement based on specifications developed by the TAG in consultation with RSPN.

The EEP for Southern bald ibis (*Geronticus calvus*), coordinated by Emile Prins, is the newest in the TAG. Cairina Pienaar (Birdlife South Africa) gave an interesting presentation about its conservation and monitoring during the TAG meeting. Actions include construction of artificial nest sites as sites are being lost due to construction of reservoirs, and the range of the species is quite limited.

Christel Griffioen (Angkor Centre for Conservation of Biodiversity, Cambodia) gave a talk at the meeting about involvement of this institution in conservation and management of Ciconiiformes in human care, such as the lesser adjutant stork (*Leptoptilos javanicus*), greater adjutant stork (*L. dubius*), giant ibis (*Thaumatibis gigantea*), white-shouldered ibis (*Pseudibis davidsoni*) and wooly-necked stork (*Ciconia epsicopus*). Funding needs range from aviary construction for greater adjutant storks to community outreach programmes for the white-shouldered ibis. The Angkor Wat Centre opened as a species conservation centre for Münster Zoo (Germany) but has received support from other EAZA zoos as well, and we hope that EAZA Members will help fund these Ciconiiiformes projects.

Southern bald ibis (*Geronticus calvus*) nesting at GaiaZOO
© Thomas Remmits

Sadly, this meeting also included the last overview of *ex situ* and *in situ* conservation and management activities for the northern bald ibis (*Geronticus eremita*) by the current EEP Coordinator Christiane Böhm (Alpenzoo Innsbruck, Austria), as she is retiring. Christiane has dedicated many years to this species and has kept us all well informed about its status and relevant actions.

The TAG also started working on the preparations for the upcoming RCP workshop, scheduled for 2023.

COLLABORATIONS

The efforts by the EAZA Lesser Flamingo Working Group, chaired by Ruben Holland (Leipzig Zoo, Germany), to improve breeding of this species are constrained by the sex ratio, as there are more than two males (335 in total) for every female in the EAZA population, and breeding seems to improve when there are more females than males. Almost half of the 146 females are found in just two zoos, Karlsruhe Zoo (Germany) and Leipzig Zoo, but efforts are being made to help zoos with a good breeding potential to acquire more. Identifying gender of the 74 currently unsexed birds could potentially help in this, however it is likely that most unsexed birds are also males, as this is a persistent problem in the population, also in AZA zoos.

CONSERVATION AND RESEARCH

The first phase of a mortality study in American flamingos (*Phoenicopteris ruber*) in EAZA zoos led by Amy Russon and Gabby Drake (Chester Zoo, UK) was concluded.

- It was found that trauma is the major cause of death
- Pododermatitis is very prevalent and more a source of morbidity than mortality; factors affecting this condition were addressed, but data were insufficient to make conclusions. Amyloidosis is also prevalent and while no association was found between it and pododermatitis, they are likely confounders.
- Atherosclerosis and heart failure are also common and generally more severe and prevalent with age, so diet and exercise might be factors, but data was insufficient to examine this properly.

Arlin Slater (Cornwall College, UK) undertook a husbandry project for the saddlebill stork (*Ephippiorhynchus senegalensis*) in collaboration with the TAG and the ESB keeper Matthias Hendel (Dresden Zoo, Germany), as this species has not been breeding well in human care. Sixteen of 27 approached zoos in the AZA and EAZA regions participated in the study, including 20 pairs in total. Eight pairs had never produced any eggs, and only four had parent-reared chicks successfully. Chicks were hand-reared at another two facilities. Data suggested that using enclosed nest platforms increases breeding success, but data was insufficient to draw a reliable conclusion.

In both above studies, participation of zoos was insufficient to draw reliable conclusions on important aspects. It is hoped that when the zoos see how important their data really is, they will participate in the second effort to complete these studies.

12 WATERFOWL AND PELECANIFORMES

TAG Chair: Johnpaul Houston (institutional support from Calviac Zoo, Calviac, France) • Vice Chair: Glyn Young (Jersey Zoo, Jersey, United Kingdom)

INTRODUCTION

The EAZA Waterfowl and Pelecaniformes TAG works with Anseriformes, Podicipediformes, Phaethontiformes, Gaviiformes, Procellariiformes, Suliformes and Pelecanidae families. Following the reinvigorated RCP, the TAG continued to concentrate on Asian, European and Madagascan wildfowl species, as well as the blue-winged goose (*Cyanochen cyanoptera*) and pelican species with an IUCN threat status. A new focus on filling gaps in husbandry knowledge is being reflected in EEPs, with the development of BPG for the sea ducks, and the grebes. The TAG met again in May at the online EAZA Bird TAGs mid-year meeting and was represented by the TAGs Chair at the WAZA joint-TAG Chairs meeting in Long Beach, USA.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

During 2022, the TAG was delighted to fill the vacant Baer's pochard EEP Coordinator position with Sandra Röhner (Saarbrücken Zoo, Germany), who has now attended the EAZA Academy population management course and is busy working out the best way forward for this interesting species.

Long-term management planning has been taking place for a number of species: the ones for lesser white-fronted goose (*Anser erythropus*), Madagascar pochard (*Aythya innotata*) and white-winged duck (*Asarcornis scutulata*) are nearing completion, and check-ins have begun for the Red-breasted goose EEP, Pink-backed / Spot-billed pelican joint-EEPs, and Grebe EEP. Very interesting discussions have taken place around some unique goals and roles in these populations.

ACHIEVEMENTS DURING THE YEAR

The TAG is happy to have completed the draft LTMPs for the species mentioned above.

Male spectacled eider (*Somateria fischeri*) © Jonathan Beilby

COLLABORATIONS

Collaboration continued between East-Asian Australasian Flyways Partnership and both programmes for the Baer's pochard (*Aythya baeri*) and Scaly-sided merganser (*Mergus squamatus*). Members of the TAG are also members of various IUCN SG Committees, such as the Threatened Waterfowl SG, including Glyn Young (Jersey Zoo, UK).

A report was again provided on the structure and output of the Waterfowl and Pelecaniformes TAG for the upcoming International Wild Waterfowl Association yearbook.

CONSERVATION AND RESEARCH

Genetics work on scaly-sided merganser was continued by Joshua Wright (Manchester Metropolitan University, UK). It has now become a PhD project and will aim to relate the population genetics in EAZA, European private institutions, AZA and wild (including museum) specimens – to understand loss of genetic diversity over time.

With pelicans – initial feasibility for re-wilding projects in the UK and the Netherlands for Dalmatian pelicans (*Pelecanus crispus*) was presented to the TAG, and the new EEP Coordinator will undoubtedly pick up on this in 2023.

ADDITIONAL COMMENTS

The focus for 2022 was the process of LTMP and check-ins for the many new EEPs. The TAG is very grateful to Raymond van der Meer and Marie Corlay (both EEO) for their help on this. Implementing these LTMPs, including linking with conservation and research suitable to each LTMP will be the focus for 2023.

13 RAPTOR

TAG Chair: Kirsi Pynnönen-Oudman (Helsinki Zoo, Helsinki, Finland)

INTRODUCTION

The EAZA Raptor TAG is divided in several subgroups, led by: Kirsi Pynnönen-Oudman (Helsinki Zoo, Finland), subgroup Owls; Jan Hanel (Liberec Zoo, Czechia), subgroup Eagles and Hawks; Marleen Huyghe (Planckendael Zoo, Belgium) and Joost Lammers (Avifauna Birdpark, the Netherlands), subgroup Vultures; and Graeme Dick (Durrell Wildlife Conservation Trust, UK), subgroup Falcons.

After the years of COVID-19, it was again possible to arrange face-to-face meetings during 2022. However, the mid-year meeting was still organised online. All the RCPs of the TAG (Owls; Vultures; Eagles, Hawks, Falcons) are ready after three years of work together with the EEO team.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

Following the RCP workshops organised online in 2021 for the vultures and for hawks, eagles and falcons, the EEP Committee approved in 2022 both the new style EAZA Raptor TAG – Hawks, Eagles, Falcons and the new style EAZA Raptor TAG - Vulture RCP reports. Both reports (as well as the RCP report

Sample collection from Rüppell's vulture (*Gyps rueppelli*) for the genetic diversity in Avifauna © Joost Lammers

of Owls, which was approved in 2021) can be found on the EAZA Raptor TAG page and the Population Management page on the EAZA Member Area. Altogether 11 EEPs for individual vulture species and one multi-species Asian vulture EEP are now proposed. In addition, for the hawks, eagles, and falcons, eight EEPs are proposed, one of them being for two species.

The EEP Committee approved the establishment of the Scops-owl EEP, coordinated by Christelle Mahy (Monde Sauvage, Belgium), in the framework of the new EAZA population management structure.

Some EEP Coordinators had to step down in 2022 and new ones (e.g. for the White-tailed sea eagle and Andean condor EEPs) are waiting for an approval of the EEP Committee.

ACHIEVEMENTS DURING THE YEAR

The mid-year meeting was held online, and had interesting talks about the eagle and falcon species by Jan Hanel (Liberec Zoo, Czechia); Egyptian vulture (*Neophron percnopterus*) release by Ido Efrat (University of Ben Gurion, Israel); tracking results by Antonín Vaidl (Prague Zoo, Czechia); update on Philippine eagles (*Pithecophaga jefferyi*) by Luís Carlos Neves (Singapore Zoo, Singapore); and the relocation programme for burrowing owls (*Athene cunicularia arubensis*) in Aruba by Pedro Nunes (Lourosa Bird Park, Portugal).

During the EAZA Annual Conference in Albufeira, a Raptor TAG meeting was held. EEP Coordinators Marleen Huyghe (Antwerp Zoo, Belgium) and Joost Lammers (Avifauna, the Netherlands) talked about the situation and future plans of cinereous vulture (*Aegypius monachus*) and white-headed vulture (*Trigonoceps occipitalis*). A research talk was given by Alessandro Di Marzio (Riga Zoo, Latvia) on the fluorescence of owls (see publications). Reintroduction experiences with little owls (*Athene noctua*) were shared by Petr Suvorov (Brno Zoo, Czechia) and Jan Hanel provided an update on Steller's sea eagles (*Haliaeetus pelagicus*) and a project in Japan.

A new Vet Advisor, Elliott Simpson-Brown, Council member of the British Veterinary Zoological Society, was appointed in 2022. We hope that a second Advisor will help with the workload caused by a high number of new EEPs.

CONSERVATION AND RESEARCH

In the Bearded vulture EEP altogether 27 nestlings survived in 2022. Fourteen have been used for five on-going projects (Alps, Grands Causses, Corsica, Maestrazgo and Andalusia) and the remaining 13 nestlings for the EEP. Unfortunately, the programme suffered many losses: altogether eight birds died due to disease and five young ones from other reasons. Research is ongoing on how to prevent the deaths of these vultures during summer months.

Breeding success in the Cinereous vulture EEP was good this year: 13 chicks hatched and 11 survived. Following this success, three chicks could be released in Sliven, Bulgaria. The release technique used was hacking by aviary and at an age of 4 months the aviary was opened to allow the chicks to fledge. Two chicks left the aviary and one of them (born in Planckendael Zoo, Belgium) flew straight down south, followed the Greek coast, crossed the Dardanelles and reached Antalya (Turkey) where he was recovered (exhausted). Ten days later he was again released in a cinereous vulture colony above Antalya, but again he started to disperse this time in the direction of Syria. Finally, he was again recovered exhausted near the Syrian border. Fortunately, the bird could be collected and housed by our Turkish colleagues of Faruk Yalçın Zoo. The other chick, born in Prague Zoo and adopted by a cinereous pair in Liberec Zoo left the aviary after several weeks and went down to Greece where it was found dead, poisoned after almost two months. The third chick is still in the aviary and will be released in spring 2023. Hopefully this delayed release will encourage this bird to stay in the release area. Poisoning is still a serious problem in the Balkan and Greek areas. To counter it, Balkan Detox Life has been established. This project works across seven Balkan countries to raise awareness and to build capacities among key stakeholders.

Rotterdam Zoo and Wageningen University (both the Netherlands) in cooperation with the EAZA Biobank started a genetic research project for the *Gyps rueppelli* EEP. The focus will be to determine genetic diversity, presence of cryptic subspecies, founder relatedness and reintroduction potential for the EEP. All EEP participants are therefore asked to collect (blood) samples from as many individuals in the EEP as possible.

ADDITIONAL COMMENTS

The following publication was submitted in 2022: Di Marzio, A., et al. (2023). *Fluorescence in European owls*. Ann. Zool. Fennici, 60: 31-51

14 GALLIFORMES

TAG Chair: Jan Dams (Antwerp Zoo, Antwerp, Belgium) • Vice Chairs: Ludo Pinceel (World Pheasant Association, Hexham, United Kingdom) and Geer Scheres (Cracid and Crane Breeding and Conservation Centre, Zutendaal, Belgium)

INTRODUCTION

The EAZA Galliformes TAG manages all species of the order Galliformes, including megapodes (*Megapodiidae*), turkeys (*Meleagrididae*), New World quails (*Odontophoridae*), pheasants and partridges (*Phasianidae*), guineafowl (*Numididae*) and chachalacas, guans, and curassows (*Cracidae*). Together with the AZA Galliformes TAG and the World Pheasant Association (WPA, UK), the TAG has been working to increase conservation efforts through the management of Studbooks, actively studying birds in our care and participating in and sharing knowledge with ongoing *in situ* projects.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

Thanks to the incredible preparation work of our colleagues of the EEO a very productive, two-day, regional collection planning workshop was held online. Galliformes specialists from all over the world were able to attend and contribute to the document. The final RCP will be published in 2023 and will be a great resource to focus our conservation efforts within the Galliformes TAG.

ACHIEVEMENTS DURING THE YEAR

TAG meetings were held during the online mid-year Bird TAGs meeting and the EAZA Annual Conference.

During the mid-year Bird TAGs meeting Jo Gregson (WPA), gave an overview of the conservation programmes the association is involved in. Christel Griffoen (Angkor Centre for Conservation of Biodiversity, Cambodia) gave a talk on their work with green peafowl (*Pavo muticus imperator*) which they rescue, breed and actively reintroduce in Cambodia. Jochen Menner (Prigen Conservation Breeding Ark, Indonesia) talked about a newly set up aviary complex that was designed specifically for Galliformes species, the hope is to breed the Critically Endangered Malay crestless fireback (*Lophura erythrophthalma*) in these aviaries.

At Annual Conference, Katharina Herrmann (Berlin Zoo, Germany) gave an update on *in situ* work being carried out for the Vietnam pheasant (*Lophura edwardsi*); Stewart Muir (Shaldon Wildlife Trust, UK) gave a talk on aviary planting; and Andrew Owen (Chester Zoo, UK) discussed how to best prepare for parent-rearing Galliformes in a zoo setting, using Cabot's tragopan (*Tragopan caboti*) and red-billed curassow (*Crax blumenbachii*) as examples.

COLLABORATIONS

The TAG's involvement in the Vietnam pheasant recovery team remains strong. In 2022, Viet Nature (Vietnam) continued its quest to find the species in its original range. Ongoing camera trap efforts haven't yielded any sightings so the chances of

Vietnam pheasant (*Lophura edwardsi*) © Hubert Fryca

Male Cabot's tragopan (*Tragopan caboti*) © Alex Levitskiy

the species surviving in the wild seem very slim. A community outreach workshop was held with all important stakeholders further paving the way to create a better future for this species. The most important news for the *ex situ* part is that a project manager has been found and appointed. Rik Dams has taken on this role and will start in March 2023 in Vietnam, where he will oversee the construction of the breeding centre and train local staff in the care and breeding of these birds. This would not have been possible without the continued support from, among others, Karlsruhe Zoo (Germany), Berlin Zoo, Prague Zoo (Czechia), WPA and Birdlife International.

CONSERVATION AND RESEARCH

For the Vietnam pheasant, life history traits were gathered to aid in the construction of a Population Viability Analysis specific for this species. This model was constructed by Caroline Lees (Conservation Planning Specialist Group) for the Re:wild group. In addition, Gary Ward (ZSL London Zoo, UK) researched the best way to track Vietnam pheasants, once they are released. This work is still ongoing.

A new conservation priority popped up in 2022: the Malay crestless fireback. Habitat loss in this species' range is rapid and as a species, it is entirely dependent on plains-level forest, the population size is thought to be declining at a similar rate, evidenced by its extirpation from many sites it formerly occupied. In addition to net losses, forest in this species' range is now heavily fragmented, opening access to smaller forest patches for hunting. Combining all these threats, the species is now thought to be declining extremely rapidly and is at great risk of extinction. For these reasons it is assessed as Critically Endangered. Unfortunately, its *ex situ* population is very small, and, up until a few years back, the population within EAZA was nonexistent. To give this species a fighting chance to overcome extinction a close cooperation with the WPA has been set up as their members hold most of the birds under human care. Centres of expertise will be sought to focus on these challenging birds, where holding several pairs to optimise breeding will be important. Luckily the Studbook keeper Marcin Chrapowicki (Warsaw Zoo, Poland) has been very active and working closely together with the WPA to build a larger population.

15 GRUIFORMES

TAG Chair: Gary Ward (ZSL London Zoo, London, United Kingdom) • Vice Chair: Maximilian Birkendorf (Neuwied Zoo, Neuwied, Germany)

INTRODUCTION

2022 was another productive year for the EAZA Gruiformes TAG. The highlights were the first in-person TAG meeting since the pandemic and the development of stronger links with the IUCN Cranes SG. In 2022, work was underway to plan for the TAG's RCP meeting to be held in June 2023 in Neuwied Zoo (Germany). More details for the meeting will be made available in due course.

The Gruiformes TAG oversees all species in the order Gruiformes, including cranes (*Gruidae*), finfoots (*Heliornithidae*), limpkin (*Aramidae*), rails and gallinules (*Rallidae*), and trumpeters (*Psophidae*), as well as the bustards (order Otidiformes), Kagu and sunbittern (order Eurypygiformes), mesites (order Mesitornithiformes) and seriemas (order Cariamiformes).

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

Petr Suvorov from Brno Zoo (Czechia) has agreed to step up as the new EEP Coordinator for Red-crowned cranes (*Grus japonensis*). Petr has been working as Vice Coordinator for the EEP and has been doing a great job getting on top of the population management challenges for this species. The Red-crowned crane Species Committee is now active with a first meeting planned for January 2023.

After many years of coordinating the Blue crane ESB, Ryszard Topola (Zamość Zoo, Poland) is stepping down from this role and Marcin Charpowicki (Warsaw Zoo, Poland) will be taking over. The TAG would like to thank Ryszard for this many years of dedication to this programme and are pleased to know that he will continue to support the TAG and assist Marcin with the Studbook moving forward.

Timo Allner, formerly of Walsrode Birdpark (Germany), has stepped down as EEP Coordinator for the Siberian crane (*Leucogeranus leucogeranus*). We wish Timo all the best in this new position at Hamburg Zoo (Germany) and thank him for his efforts in managing this EEP. The Siberian crane EEP will remain in Walsrode and a new Coordinator will be appointed in the near future.

ACHIEVEMENTS DURING THE YEAR

At the EAZA Annual Conference, the TAG held its first in-person meeting since 2019. It was a very productive meeting with a keynote presentation from Kerryn Morrison (IUCN Crane SG), who joined online from South Africa and gave a fantastic overview of the work the SG is involved with. We had two excellent presentations on the topic of mixed species exhibits for cranes. One was from Taylor Keddie, Coordinator of the AZA Red-crowned crane SSP, reporting on his research into crane mixed exhibits including some nice examples of cross taxa exhibits that have been successful.

East African grey-crowned crane (*Balearica regulorum gibbericeps*) © Rostock Zoo

The second was from Paul Rose, Research Coordinator for the EAZA Gruiformes TAG, who outlined ideas for further research. We also had programme reports from Petr Suvorov on the Red-crowned crane EEP and Michael Merker (Halle Zoo, Germany) on his monitoring of Trumpeters (*Psophia sp.*). Finally Max Birkendorf (Neuwied Zoo, Germany), TAG Vice Chair, presented on some crane education ideas and reported on the overview of the state of crane populations both *in* and *ex situ*.

COLLABORATIONS

This year saw strong links being established between the EAZA Gruiformes TAG and the IUCN Crane SG with the Chair of the SG presenting during the EAZA Annual Conference, and the TAG supporting a SG fundraising initiative for a Conservation Planning Workshop for blue cranes. We should acknowledge Neuwied Zoo for generously providing € 10,000 for this.

Both the TAG Chair and Vice Chair have accepted an invitation to join the IUCN Crane SG as Advisors on *ex situ* management. We have been collaborating with the SG and colleagues from AZA in providing advice for the training of a new Studbook keeper for the wattled cranes (*Bugeranus carunculatus*) in South Africa, which are managed as a captive component of the conservation efforts for the species in this country.

CONSERVATION AND RESEARCH

Ryan Berry (Longleat Safari Park, UK) is monitoring grey crowned cranes (*Balearica regulorum*), that we highly expect to be recommended for EEP management after the RCP assessment in 2023. Ryan is currently researching which of the two subspecies are currently found in EAZA collections. Holders have been asked for photographs of the cheek wattles. The amount of red on the check wattles indicates which subspecies you may have with the East African subspecies (*B. r. gibbericeps*) showing more red on the wattles than the Southern subspecies (*B. r. regulorum*). The TAG requests that holders please assist Ryan by providing photos and information.

16 CHARADRIIFORMES

TAG Chair: Simon Matthews (Wildfowl & Wetlands Trust Slimbridge, Slimbridge, United Kingdom)

INTRODUCTION

2022 has hopefully been the last of the slower years of the EAZA Charadriiformes TAG. It was the year of our RCP workshop, where we were able to review our species and programmes, and address population declines and other issues we are witnessing with this taxon in line with the "new" population management structure. We wish to thank the team at the EEO for all their work preparing, planning and hosting the meetings.

The new RCP will be published in 2023 and a few new programmes will be added, please watch out for how and where you may be able to help.

We also spent this year looking for a Vice Chair and this role remains vacant. If you are passionate about waders and seabirds please do get in contact, the RCP will bring new work and challenges, and any support would be greatly appreciated.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

For the RCP workshop, we grouped our species based on an agreed criteria that fitted our mission. Notes from the meeting are currently being collated and the RCP written up with 10 groups being proposed as EEPs, each group led by a focus species. A further eight species were suggested as monitored by the TAG with a species champion. We hope to find some volunteers to fill and support these new and exciting roles.

The current Inca tern ESB position is still vacant.

The long-awaited BPG for the Atlantic puffin (*Fratercula arctica*) are in the final draft stages and we will soon re-submit them to the EEP Committee for final approval.

COLLABORATIONS

Late in the year, ZSL's Institute of Zoology released a paper on the impact of climate change on north-east Atlantic seabirds and the potential conservation actions needed to assist them. The TAG has contacted the author and is in the process of assisting, and linking NGOs with the collections who have the potential skills to help our *in situ* populations.

We are in contact with some rescue centres and there is potential for work here. A number of species in our taxa are frequently seen there and we believe we can gain a lot from their experience, and share resources and knowledge with them to better support all our goals for the charadriiforme birds. More on this to come in 2023.

Young grey gulls (*Leucophaeus modestus*) at Heidelberg Zoo
© Susanne Reichardt

17 PIGEON AND DOVE

TAG Chair: Duncan Bolton (institutional support from Paignton Zoo, Paignton, United Kingdom) • Vice Chair: Nigel Simpson (Wild Place, Bristol, United Kingdom)

INTRODUCTION

During 2022 the EAZA Pigeon and Dove TAG's long standing Chair Duncan Bolton (Paignton Zoo, UK) stepped down from his role. He has been the Chair since the beginning of this TAG over 25 years ago and has dedicated his time and experience to the conservation of pigeons and doves all along. Duncan's external responsibilities have recently changed, and the publication of the RCP was a timely event for him to step down. The TAG would like to thank Duncan for all his input and leadership and the wider conservation of Columbidae both within EAZA and globally.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

After a successful RCP workshop held in 2021, the new RCP for pigeons and doves was published in August 2022. This document proposes 15 new style EEPs in addition to the existing EEP for Santa Cruz dove (*Alopecoenas sanctaecrucis*). Nine of these are upgraded from old style EEP or ESB. Most of the previous programme Coordinators will be proposed to remain for the new style EEPs, but there are still some vacant EEPs that need to be filled. The vacant EEPs include Nicobar pigeon (*Caloenas nicobarica*), large frugivorous pigeons (*Ducula carola, bicolor, aenea*) and (*Columba arquatrix*), Crested quail dove (*Geotrygon versicolor*), Tuxtla quail dove (*Zentrygon carrikeri*) and the European turtle dove (*Streptopelia turtur*).

Two significant areas of interest with the new EEPs and new Coordinators cover trade and extinct birds.

- The EEP for the Blue-headed quail dove (*Starnoenas cyanocephalus*) covers a species that has entered some EAZA zoos after an export from Cuba. Basil von Ah (Zürich Zoo, Switzerland), EEP Coordinator, has already begun investigations to determine the origin of these birds and their relatedness within the EEP population and with the assistance of Simon Bruslund (Marlow Birdpark, Germany) will be collaborating with colleagues in Cuba
- The atypical EEP for Dodo (*Raphus cucullatus*) and Passenger pigeon (*Ectopistes migratorius*) will be coordinated by Frank Brandstaetter (Dortmund Zoo, Germany) to raise awareness of the plight that many of our current extant species may also be facing.

The LTMP for Socorro dove (*Zenaida graysoni*) was started in 2022 and will be concluded in 2023. Plans for LTMPs for the remainder of the new EEPs will be implemented throughout 2023.

ACHIEVEMENTS DURING THE YEAR

A welcomed return to an in-person TAG meeting took place during the EAZA Annual Conference in Albufeira (Portugal) in October 2022. The meeting was well attended, and we welcomed Matt Ward, Director of Talarak Foundation Inc in the Philippines, to present on their efforts to maintain a

programme for Negros-bleeding heart doves (*Gallicolumba keayi*) under human care and the first translocation of this species to a new site in Southern Negros Island. This Critically Endangered species will be included in our new style Bleeding heart dove EEP with birds now outside of the Philippines being kept at Singapore Zoo (Singapore).

COLLABORATIONS

TAG members continue to contribute to the IUCN SG for Pigeons and Doves, with examples from some of our programmes' species incorporated into a Position Statement on the increasing threat of illegal trade in Columbidae.

CONSERVATION AND RESEARCH

Talarak Foundation in partnership with Toledo Zoo (USA) and Bristol Zoo (UK) have begun releasing Negros-bleeding heart doves in an area of protected secondary forest in Bayawan Nature Reserve (Philippines). At the time of the presentation in October, two separate releases of a pair of birds had taken place. Lots of new data on this species has been gathered at this release site that can be used for future releases.

The Socorro dove project has been impacted over previous years with the pandemic, but research into biological and environmental threats to the Socorro dove project started in 2022, with further progress expected in 2023.

ADDITIONAL COMMENTS

The TAG published an article in Zooquaria 116 about the RCP process, highlighting the vacant new style EEPs as well as the existing programme changes.

Socorro dove (*Zenaida graysoni*) © Stefan Stadler, Frankfurt Zoo

18 PARROT

TAG Chair: Simon Bruslund (Marlow Birdpark, Marlow, Germany) • Vice Chair: Laure Pelletier (Beauval Zoo, Saint Aignan, France)

INTRODUCTION

A recent, simple ZIMS review by the EAZA Parrot TAG showed that parrots remain popular in EAZA zoos and that average parrot populations have stayed stable since the last review in 2016. While the species diversity has dropped marginally, there are still over 300 different species and subspecies of parrots kept in EAZA zoos. Around 250 EAZA Members and ZIMS users keep on average 10.9 parrot taxa each. Overall, more than 18,000 parrots live in EAZA institutions. Unfortunately, the desired shift towards a higher percentage of Threatened vs. Least Concern parrot species kept is still only marginally visible and may demand an even more decisive effort with the new RCP workshop in 2023. Consequently, the Parrot TAG follows a strict strategy to prioritise the development of coordinated programmes for the most conservation-dependent species.

During 2022, the IUCN Red List included changes in status for 46 parrot species: most species, and in particular 18 Amazon Rainforest species, were down-listed based on changes in prospected forest loss in the coming decades based on the recent 2021 Global Forest Watch report (http://www.globalforestwatch.org). For some of these species with specialised micro habitats or facing unsustainable use, this is somewhat concerning as these changes do not necessarily reflect the real situation "on the ground". Lack of tangible population-trend data in wild populations remain a major challenge. In seven species the status was up-listed mostly based on new information and particularly concerning are the unexpected changes from Least Concern to Vulnerable in three Australian species: glossy black-cockatoo (*Calyptorhynchus lathami*), gang-gang cockatoo (*Callocephalon fimbriatum*) and blue-winged parrot (*Neophema chrysostoma*).

A dedicated IUCN SSC Specialist Group to represent parrots in such discussions is missing. In compensation the joint Parrot TAGs in regional associations ZAA, Southeast Asian Zoo Association (SEAZA), Pan-African Association of Zoos and Aquaria (PAAZA), EAZA, Latin American Association of Zoological Parks and Aquariums (ALPZA) and AZA have started discussions which more recently also involves the new IUCN Global Centre for Species Survival. Unfortunately, even with the joint TAG Chairs meeting in Long Beach, USA these efforts failed to progress in 2022.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

Several programmes are in development pending the upcoming RCP workshop in 2023 but two major changes occurred during 2022:

- Lesley O'Connor (Paignton Zoo, UK) retired as Coordinator of the Red-tailed amazon EEP, which was taken over by Basil von Ah (Zürich Zoo, Switzerland). The Parrot TAG wishes to thank Lesley sincerely for her effort and dedication to this

The blue-winged parrot (*Neophema chrysostoma*) was one of the species which surprisingly climbed up on the IUCN Red List during 2022 © Roland Wirth, ZGAP

programme over many years

- Andy Cope (Bristol Zoo, UK) retired from the Kea ESB and Franck Haelewyn (Parrot World, France) took over the ESB. Many thanks to Andy and Bristol Zoo for managing this successful Studbook for many years

ACHIEVEMENTS DURING THE YEAR

Two Parrot TAG meetings were held during 2022.
In April during the online Bird TAG mid-year meeting, we had presentations on the Ultramarine Lorikeet Project in French Polynesia by Caroline Blanvillain (Société d'Ornithologie de Polynésie), on African grey parrots (*Psittacus erithacus*) at the Limbe Wildlife Centre (Cameroon) by Peggy Motsch and an update from the Katala Foundation (Philippines) on the red-vented cockatoo (*Cacatua haematuropygia*) projects by Peter Widmann. Further we heard about husbandry developments in Vienna Zoo (Austria) for swift parrots (*Lathamus discolor*) by Simone Haderthauer and on the first year of the new EAZA Member Parrot World by Corentin Prigeant. Finally, the new EAZA Cockatoo Working Group (ECWG) was introduced by Mark Rusli (Singapore Zoo, Singapore) and the team members.

In September, the TAG annual meeting was held during the EAZA Annual Conference in Albufeira (Portugal) and included an update from the ECWG and from the projects in the Philippines as well as a useful presentation on aviary interior design for parrots "*Unlocking the Wild Side of Captive Parrots: Modifying Enclosures to Enable Wild-Type Behaviours*" by Ricardo Lemos de Figueiredo (University of Birmingham, UK).

The species pre-selection criteria for the planned 2023 Parrot RCP workshop and priority species list were presented and discussed.

COLLABORATIONS

Parrot TAG Education Advisor Stephan Worm who develops the World Parrot Day material on behalf of the TAG moved from Serengeti-Park Hodenhagen to Magdeburg Zoo (both Germany) and thereby changed institutional support. The World Parrot Day is celebrated every year on 31 May and the TAG encourages all EAZA Members to use it for educational purposes. Material and inspiration are freely downloadable on www.parrottag.org.

Borbála Kocsis (Budapest Zoo,Hungary) started a monitoring on golden-shouldered parrot (*Psephotellus chrysopterygius*) on behalf of the TAG, and zookeeper students at Roskilde Technical College (Denmark) investigated rainbow lorikeet (*Trichoglossus moluccanus*) populations in ZIMS with their teachers resulting in a poster for the EAZA Annual Conference.

CONSERVATION AND RESEARCH

As part of ongoing research collaboration with the Max Planck Institute (Germany) a joint paper was published on the relative brain size and the life expectancy in parrots using amongst other sources also ZIMS data (see reference below). It received quite some interest in the press.

Ongoing collaboration on genetics in yellow-crested cockatoos (*Cacatua sulphurea*) between the TAG, the EEP and the University of Gießen (Germany) achieved some progress in the methodology.

The TAG started a new research collaboration with Wildlife's Welfare (the Netherlands) on their Tropical Parrots Project looking into temperature requirements of truly tropical parrots in human care.

ADDITIONAL COMMENTS

Smeele, S. Q. et al. (2022). *Coevolution of relative brain size and life expectancy in parrots*. Proc. R. Soc. B., 289 (1971): 20212397

19 TOUCAN AND TURACO

TAG Chair: Koen Brouwer (Attica Zoological Park, Athens, Greece) • TAG Vice Chair: Joost Lammers (Avifauna Birdpark, Alphen aan den Rijn, the Netherlands)

INTRODUCTION

The EAZA Toucan and Turaco TAG has been managed under the umbrella of the EAZA Hornbill TAG since 2021. Two meetings were conducted in 2022, one online as part of the EAZA Bird TAG mid-year meeting, and the other as part of the EAZA Annual Conference in ZooMarine (Portugal). The TAG continued to work on creating a new and solid structure of subgroup leaders for relevant taxa such as bee-eaters, rollers, turacos, hummingbirds and toucans. We plan to have new leadership in place after the RCP is finalised and approved, which most likely will be by early 2024.

Great blue turaco (*Corythaeola cristata*) © Avifauna Birdpark

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

The RCP for the TAG is planned for late 2023. It will focus on species kept in EAZA zoos as well as on conservation-sensitive species not kept in EAZA collections, for instance those in need of *in situ* support.

BPGs are in preparation for bee-eaters and for channel-billed toucans (*Ramphastos vitellinus*). They should be available in 2023. It also has been suggested to develop BPG for the collared trogon (*Trogon collaris*), or perhaps for trogons in general in 2023.

Several turaco species are still managed as ESBs, such as the violet turaco (*Turaco violaceus*). The ESB is managed by Andrzej Kruszewicz and Marcin Chrapowicki of Warsaw Zoo (Poland). There is a large population of these birds (74.78.22) in 78 EAZA institutions with sadly little interest by potential new holders/institutions, making it hard to find good homes for birds that need to be outplaced.

The Fischer's turaco (*Tauraco fischeri*) ESB – managed by Gavin Harrison (Waddesdon Manor Aviary, UK) – also saw a slight increase of birds but with a shortage of females. No serious issues in finding EAZA zoos interested in keeping this IUCN Near Threatened species are reported yet.

Annual monitoring reports for bee-eaters were prepared by Maarten Vis (Rotterdam Zoo, the Netherlands) and for rollers by Luke Forster (Blackpool Zoo, UK). Both taxa are confronted with different issues, the rollers are attractive birds that seem to lack the interest of zoos, whereas current holders are having a difficult time maintaining the populations of bee-eaters species kept in the EAZA region over the longer term. The full reports are available on the TAG space of the EAZA Member Area.

ACHIEVEMENTS DURING THE YEAR

Chester Zoo (UK) received a pair of collared trogons through confiscation in 2017. They have been successfully caring for them and they reported the world first breeding of the species in 2019. In a presentation at the EAZA Annual Conference, Andrew Owen, Lauren Hough (both Chester Zoo) in collaboration with Jonathan Beilby (London Wetland Centre, UK) introduced this successful project and made clear that the collared trogon could be a potential model species for other threatened trogons, such as the IUCN Vulnerable Javan trogon (*Apalharpactes reinwardtii*) and IUCN Critically Endangered Alagoas trogon (*Trogon muriciensis*). At the writing date of this report (15 March 2023), there were 8.13 collared trogons in four EAZA collections (on ZIMS).

The first European Studbook for Channel-billed toucans was published by Dijana Beneta (Zagreb Zoo, Croatia) in 2022. Currently there are 45 (21.15.9) individuals in 19 institutions, of which only 28 (21.7.0) are in 11 EAZA Member institutions. The youngest bird is 4 years and 3 months old (female) and the oldest toucan is 31 years and 3 months old (male). Breeding results were not achieved in 2022, and drastic measures are required to maintain the species in EAZA collections.

A Studbook was also published for the red-billed toucan (*Ramphastos tucanus*) by ESB Coordinator Mary Kantarelou (Attica Zoological Park, Greece). Here, 36 (19.16.1) birds are living at 17 institutions with 10 EAZA zoos keeping 18 birds (10.8.0) only. As with most of the toucans, breeding in EAZA collections is rare, which can be attributed to several potential factors such as incompatible pairs, hand-reared birds or insufficient institutional cooperation. These issues and others will be discussed during the 2023 RCP, as urgent solutions in some cases and decisions in others are necessary to maintain sustainable populations over the longer term.

There are also a few "success" stories of toucans in EAZA zoos, such as the keel-billed toucans (*Ramphastos sulfuratus*) at Ouwehands Zoo (the Netherlands). Their current pair produced 12 chicks in a period of three years (2019-2021); in 2002 there were only eggs and no chicks. José Kok (Ouwehands Zoo) gave a short presentation at the EAZA Annual Conference in which, amongst others, data on the incubation (approximately 18 days) and fledging period (five weeks) was provided. Sadly, and despite the success at Ouwehands Zoo, the future for this species in EAZA is not bright with only 5.3 birds in six collections.

CONSERVATION AND RESEARCH

Nordens Ark (Sweden), in close collaboration with several other Swedish zoos (e.g. Järvzoo and Skansen Zoo) and conservation organisations (such as the Swedish Society for Nature Consevation), has worked many years on developing a method to breed and release the white-backed woodpecker (*Dendrocopos leucotos*) into the wild in Sweden. The programme was initiated in 1990 and Nordens Ark started the planning of the *ex situ* breeding component in 1995. Founder birds were acquired from Norway. Successful breeding and releases have occurred over the years, and some 159 woodpeckers from 66 clutches were fledged between 2001–2021.

20 HORNBILL

TAG Chair: Koen Brouwer (Attica Zoological Park, Athens, Greece) • TAG Vice Chair: Joost Lammers (Avifauna Birdpark, Alphen aan den Rijn, the Netherlands)

INTRODUCTION

The EAZA Hornbill TAG looks back upon a relatively successful year. Research project on breeding and keeping large Asian hornbills, conservation involvement, increased efforts to produce BPG and the positive evaluation of the TAG were but a few of the highlights of 2022.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

Thanks to the support of the EEO, and in close cooperation with the relevant EEP Coordinators and the TAG, two LTMPs were prepared and published for black hornbills (*Anthracoceros malayanus*) and Visayan tarictic hornbills (*Penelopides panini*) in 2022. Another LTMP was published earlier for Northern ground hornbills (*Bucorvus abyssinicus*) and eight more are on the agenda to be started and/or finalised in 2023.

The Hornbill TAG was evaluated as good by the EEP Committee, TAG members and the EEO in 2022. Points to work harder on include the production of BPGs and more research on the low rate of reproduction in the larger Asian hornbills, especially the *Buceros* and *Rhyticeros* species. BPGs are high on the agenda of the TAG, and it is sincerely hoped to have the *Bucorvus* hornbills document published in 2023. The first version of the EAZA Hornbill Management and Husbandry Guidelines was published in 2002 and has been a leading document used by keepers around the world. A draft version of the BPG will be available in 2023 with bachelor students of VHL University of Applied Sciences (the Netherlands) assisting the TAG in this effort.

Adult black hornbill (*Anthracoceros malayanus*) © Paradise Wildlife Park

ACHIEVEMENTS DURING THE YEAR

Remarkable breeding successes occurred in the Black hornbill EEP after several years of seeing the population decline. Pairs in Drayton Manor Park and Paradise Wildlife Park (both UK) successfully reared three clutches and thereby added four much needed birds to the EEP population for this IUCN Vulnerable species. A third collection, Birdworld Farnham (UK, non-EAZA) also bred black hornbills in 2022 and will hopefully participate in the EEP in 2023.

COLLABORATIONS

The Hornbill TAG hosted a meeting during the EAZA Annual Conference on 30 September. Presentations were given on "Artificial insemination in Papuan hornbills (*Rhyticeros plicatus*)" by Eric Diener (Heidelberg Zoo, Germany). Further development of this tool could lead to successful breeding in compatible pairs that have so far produced infertile eggs. The TAG is grateful to German colleagues Michael Lierz (Karlsruhe Zoo), Dominik Fischer (Wuppertal Zoo) and Eric Diener (Heidelberg Zoo) for their leadership in this important work.

Another presentation at the TAG meeting was by Matt Ward (Talarak Foundation Inc, the Philippines) and focused on their important hornbill conservation work. The Visayan tarictic hornbill EEP and the TAG have been a partner in the Philippines projects since the very start. It was extremely exciting and rewarding to know that the first *ex situ* hatched tarictic hornbills that were released to the wild in the Bayawan Nature Reserve (Negros Oriental) in 2021 have now successfully bred.

CONSERVATION AND RESEARCH

Virtually nothing is known about the status and biology of the Northern ground hornbill in the wild. The EEP for this species continued to support a newly initiated conservation project of the Mabula Ground-Hornbill Project in Ghana. The EEP collected some € 16,500 to fund the kick-off of this project. The initial results of the field work are worrisome as only adult birds have been located in the wild. Good quality nesting trees and juvenile birds were not observed in the first months.

Several interesting research projects commenced in 2022. The first project, by Kenia Cohen-Tannoudji (Paris Nord Sorbonne University, France) and supervised by EEP Coordinator Laure Pelletier (Beauval Zoo, France), focused on monitoring the behaviour and endocrine status of a so far unsuccessful pair of Javan rhinoceros hornbill (*Buceros rhinoceros silvestris*) during the breeding season in Beauval Zoo. During the observation period the female in particular showed signs of interest in breeding, which resulted in the first infertile egg in the eight years that this pair has been together.

The second project was executed by Kees Groot as part of his Master's thesis at Sparsholt College (UK). In close cooperation with EEP Coordinator Cathy King (Lagos Zoo, Portugal) and the TAG, the breeding and husbandry of the Papuan and bar-pouched wreathed hornbills (respectively, *Rhyticeros plicatus* and *R. undulatus*) in European, Asian and North American zoos were studied. A presentation was given at the EAZA Annual Conference, and the thesis is available on the Hornbill TAG section of the EAZA Member Area.

The TAG also discussed the importance of intensifying our focus on the issue of iron-storage in hornbills, especially in the *Rhyticeros* hornbills as necropsies of four birds in recent years in the AZA and EAZA regions indicated a cause of death related to hemochromatosis.

ADDITIONAL COMMENTS

The issue 114 of Zooquaria included an article titled "How to breed a hornbill" written by Václav Štraub, Kamil Čihák (both Zlín-Lešná Zoo, Czechia) and TAG Vice Chair Joost Lammers (Avifauna Birdpark, the Netherlands). The article describes the difficulties and challenges of breeding the great hornbill (*Buceros bicornis*). The authors are optimistic that the relatively young pair at Zlín-Lešná Zoo will be successful in the years to come.

21 SONGBIRD

TAG Chair: David Jeggo (Cologne Zoo, Cologne, Germany) • TAG Vice Chair: Simon Bruslund (Marlow Birdpark, Marlow, Germany)

INTRODUCTION

The EAZA Songbird TAG currently oversees 17 EEPs and several other species are being monitored by the TAG in different stages towards developing formal programmes. Additionally, the Silent Forest Group focuses on coordinating the TAG's conservation work.

During 2022 the IUCN Red List included changes in status for 132 songbird species of which most are doing better (i.e. downlisted). However 30 species were uplisted, of which the diamond firetail (*Stagonopleura guttata*) moved from Least Concerned to Vulnerable may be of particular concern for EAZA Members and the TAG. Songbirds are a mega-diverse group of vertebrates and includes over 6,500 species and, although only 18% of the world's songbirds are threatened, this still represents over 1,000 species, which poses a real challenge to monitor.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

Although several new programmes and documents are being developed, none were formalised during 2022.

The Silent Forest Group expanded its mandate to include all geographical regions and threats other than trade which had been the historical role of the group during the 2017-2019 EAZA Silent Forest conservation campaign and before this, in the Group's various guises since it first convened in 2011. This focus on Asian songbirds mainly threatened by unsustainable trade is now covered by the IUCN SSC Asian Songbird Trade Specialist Group (ASTSG).

At the CITES CoP19 from left to right: Roger Safford, BirdLife International, Simon Bruslund, EAZA Silent Forest Group, Dalia Conde, Species360, Bibiana Sucre, Provita and Danny de Man, EAZA © Gavrielle Kirk-Cohen, Species360

ACHIEVEMENTS DURING THE YEAR

A Silent Forest presentation was made at the Rigi-Symposium - an annual scientific exchange forum of the National Zoo Association of Switzerland.

The Songbird TAG was evaluated by the EEP Committee in 2022. Overall, there was a good (66.6%) response rate from TAG members to the evaluation request. In general, the functioning of the Songbird TAG was considered as "very positive", with an average rating of "good". Check-in calls were held for the Sumatran laughingthrush EEP between the Coordinator and the EAZA Population Management Centre.

The TAG Vice Chair participated in the joint TAG Chairs meeting in Long Beach (USA) and made two presentations on songbirds during the AZA Bird TAG mid-year meeting in the same location.

The Songbird TAG held three meetings during 2022: during the online Bird TAG mid-year meeting, at the EAZA Annual Conference and a closed Silent Forest meeting dealing with updating, planning and funding issues.

The Vice Chair represented the Silent Forest Group at the CITES CoP19 in Panama as part of the EAZA delegation, in the role of an Observer NGO. There we strongly advocated for the better use of CITES to achieve increased protection of songbirds. During the event we presented on songbirds and about the research cooperation with the Monitor Conservation Research Society and Species360 Conservation Science Alliance. See https://www.silentforest.eu/resources/silent-forest-cites-cop19/ for more information and in the

collaboration section below.
On the Silent Forest website around two dozen new posts and pages were published during 2022, in addition to the usual website maintenance which is entirely carried out by the TAG.

COLLABORATIONS

The Songbird TAG works closely together with the ASTSG with the TAG Chair also chairing ASTSG and several TAG members also being in the ASTSG membership. The TAG Chair and Vice Chair participated in ASTSG webinars and other activities.

Together with the partners Monitor Conservation Research Group (Monitor) and Species360 Conservation Science Alliance, intensive work in preparation of the CITES CoP19 was carried out, including research activities in support of the two songbird listing proposals, in cooperation with BirdLife International and others. Both proposals - for moving the straw-headed bulbul (*Pycnonotus zeylanicus*) from Appendix II to I and for listing white-rumped shama (*Kittacincla malabarica*) in Appendix II - were successfully adopted.

We worked with the Société d'Ornithologie de Polynésie "Manu", BirdLife's partner for French Polynesia, on conservation strategies and fundraising for the Critically Endangered Fatu Hiva monarch (*Pomarea whitneyi*).

Other ongoing partnerships include with the Oriental Bird Club (UK) and the IUCN SSC Asian Species Action Partnership.

CONSERVATION AND RESEARCH

The TAG advised on a conservation project for the locally threatened crested lark (*Galerida cristata*) in South-West Germany which led to authorities banning free-roaming domestic cats during the breeding season. The measure led to several, previously unsuccessful, pairs fledging young successfully.

New projects supported financially through the Silent Forest Group during 2022 included "Community Based Java Sparrow Monitoring in Gunung Sewu Geopark" in support of the Java sparrow (*Lonchura oryzivora*) sponsored by Wilhelma Zoo (Germany), Basel Zoo (Switzerland), the German Society for species-preserving bird breeding (GAV), and the Wak Gatak Songbird Rehab Centre mainly funded by Rostock Zoo (Germany).

Research in collaboration with Monitor on the trade in songbirds in 2022 focused amongst other things on butcherbirds (*Cractus* spp.) and black-throated laughingthrush (*Garrulax chinensis*) as well as on the joint initiative, Songbirds in Trade Database which is ongoing. See www.silentforest.eu/in-situ-projects/monitor-songbird-lab for more.

ADDITIONAL COMMENTS

Important reports were jointly published in relation to the CITES CoP19 and are available on the Silent Forest website:

- Species360 Conservation Science Alliance (2022). *Summary: Species Knowledge Initiative to Support CITES Decisions and Recommendations for Songbirds*. Species360, Minneapolis, MN, USA & University of Southern Denmark, Denmark
- Bruslund S. eds. (2022) *Essays on Live Songbird Trade and Ex situ Conservation Annex 2* supplement to the *"Species360 2021, Species Knowledge Initiative to Support CITES Decisions and Recommendations for Songbirds, Species360 Conservation Science Alliance, Minneapolis, MN & Interdisciplinary Centre on Population Dynamics, University of Southern Denmark, Denmark"*

Was also published:
Bruslund S. (2022). *When Collectors' Trade Becomes an Additional Threat: The Case of the Collared Laughingthrush.* Dawn Chorus, Newsletter of the IUCN SSC Asian Songbird Trade Specialist Group, 2(1): 9-10

The Critically Endangered cherry-throated tanager (*Nemosia rourei*) is a new focus for which the Silent Forest Group aim to fundraise during the coming year © Gustavo Magnago, Instituto Marcos Daniel

22 MONOTREME AND MARSUPIAL

TAG Chair: Flemming Nielsen (Copenhagen Zoo, Copenhagen, Denmark) • TAG Vice Chairs: Achim Winkler (Copenhagen Zoo, Copenhagen, Denmark) and Matthias Papies (Berlin Tierpark, Berlin, Germany)

INTRODUCTION

The main step in 2022 was the final approval of the RCP for the EAZA Monotreme and Marsupial TAG (M&M TAG) as a valuable basis for the future management of the various species under the TAG's remit. During the RCP workshop, 42 species were discussed individually. As a result, 19 new style EEPs are proposed by the TAG for establishment, of which 11 are currently old style EEPs/ESBs, and eight are new programmes, namely for Long-nosed potoroo (*Potorous tridactylus*), Eastern quoll (*Dasyurus viverrinus*), Western grey kangaroo (*Macropus fuliginosus*), Parma wallaby (*Macropus parma*), Short-beaked echidna (*Tachyglossus aculeatus*), Long-beaked echidna (*Zaglossus bruijnii*), Common bear cuscus (*Ailurops ursinus*), and South American marsupials (*Monodelphis domestica*, *Philander opossum*, *Marmosa murina*, *Didelphis marsupialis*). Applications are under way for several new style EEPs.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

An update on the TAG's programmes with key developments for 2022 can be found below:

- MON-P for Short-beaked echidna: Two subspecies of short-beaked echidnas held within the EAZA region with occasional breeding successes. Plans to also manage the Critically Endangered Western long-beaked echidna, although presently not held within EAZA
- EEP for Tasmanian devil (*Sarcophilus harrisii*): New imports arrived at Copenhagen Zoo (Denmark) to stabilise the EAZA population and to start breeding again. Possible amendments are needed for the existing Devil Ambassador Programme
- MON-P for Eastern quoll: Quoll population expanded due to breeding successes at Leipzig and Frankfurt Zoos (Germany). Due to the short lifespan, new imports are required to maintain a healthy genetic base
- EEP for Koala (*Phascolarctos cinereus*): Small genetic base of the present population in EAZA. New imports from Australia needed, ideally animals free of the deadly KoRV strains. BPG are in the final stage and will be published in 2023
- EEP for Common wombat (*Vombatus ursinus*): Current population in EAZA consists of small numbers of mainland common wombats as well as Tasmanian common wombats *(V. ursinus tasmaniensis).* New imports needed. Import to EAZA of 2.2 common wombats of the Tasmanian subspecies from Tasmania in September
- EEP for Bilby (*Macrotis lagotus*): Species presently not kept in EAZA with no animals available from Australia. Species declining in the wild
- EEP for Kowari (*Dasyuroides byrnie*): Small European population. Questionnaire circulated to gain a better understanding of the husbandry practices at the various holding institutions

Tasmanian common wombat (*Vombatus u. tasmaniensis*)
© Copenhagen Zoo

- EEP for Common bear cuscus: Very small population within EAZA. Coordinator position vacant
- MON-P for Long-nosed potoroo: EAZA population expanding. Genetic studies under way to determine the subspecies status of the animals held within Europe. Preliminary results show the subspecies held In EAZA is the Tasmanian subspecies *Potorous tridactylus apicalis*
- EEP for Goodfellow's tree kangaroo (*Dendrolagus goodfellowi*): Small population with limited breeding successes. New founders needed. Flagship species for conservation in Papua New Guinea and managed as part of a Global Species Management Programme
- EEP for Brush-tailed bettong (*Bettongia penicillata*): Rehoming of animals difficult. Breeding institutions need to be able to keep offspring for longer or need to consider a breed and cull policy, which is considered the best suited population management approach for the species
- EEP for Yellow-footed rock wallaby (*Petrogale xanthopus xanthopus*): Expanding population. Need for new holders. BPG published in 2022
- ESB for Swamp wallaby (*Wallabia bicolor*): Stable population. Survey underway to gain a better overview of the pedigree of the current population in EAZA
- ESB for Tammar wallaby (*Macropus eugenii*): Downgrade to status of monitor by TAG, due to non-threatened status of the species in the wild
- EEP for Parma wallaby: Large population in EAZA. Coordinator needed
- ESB for Red kangaroo (*Macropus rufus*): Large population. Difficult rehoming of animals
- ESB for Eastern grey kangaroo (*Macropus giganteus*) and MON-P for Western grey kangaroo: Large populations. Clarification needed on the subspecies status of some animals. Difficult rehoming of males
- South American marsupials: Coordination of four threatened opossum species in the American region is regarded to be managed as one single programme, due to low number of animals presently held within EAZA. Coordinator needed

ACHIEVEMENTS DURING THE YEAR

Following the approval by the EEP Committee in early 2022, the RCP of the M&M TAG was published and is available on the Population Management page of the EAZA Member Area. As part of the EAZA Annual Conference 2022, the TAG Chair and Vice Chair attended the TAG Chair meeting and a separate M&M TAG meeting was held with – among others – an update on the development of the TAG and its Programmes.

A final agreement was made with San Diego Zoo (USA) to shift the ownership of all koalas held in Europe, which was originally with San Diego Zoo, to the various European holders, so that the Koala EEP can be managed independently.

Matthias Papies (Berlin Tierpark, Germany) finalised a report on 73 macropod walk-through exhibits in European zoos, with information on exhibit size, species held, management practices, etc.

COLLABORATIONS

The TAG continues to cooperate with the IUCN M&M SG and ZAA. They also collaborate with the Australian ministry to formulate a new Position Statement for the export of Australian monotremes and marsupials on an association-to-association or TAG-to-TAG basis only.

CONSERVATION AND RESEARCH

Most European koala holders continue to pay an annual contribution fee to support the ongoing koala conservation and research projects in Australia coordinated by San Diego Zoo.

Scientific research is ongoing in conjunction with the Leibniz Institute for Zoo and Wildlife Research (IZW, Germany), the Robert Koch Institute in Hamburg (Germany) and the University of Nottingham (UK) in collaboration with experts from Australia to gain a better understanding of the effects of the various strains of the koala retrovirus (KoRV) on the health status of the koala.

Yellow-footed rock wallaby (*Petrogale xanthopus*) © Copenhagen Zoo

The Tree kangaroo Global Species Management Plan (GSMP) supports the Tenkile Conservation Alliance focusing on conservation actions for the Tenkile tree kangaroo (*Dendrolagus scottae*) in Papua New Guinea.

Members of the Tasmanian devil EEP support the Devil Ambassador Programme in Tasmania.

ADDITIONAL COMMENTS

The M&M TAG thanks Kelly Lavooij-van Leeuwen, EAZA Animal Programmes and Conservation Coordinator and TAG liaison until August 2022, for her successful support to the TAG. We welcomed Diogo Laneiro, her replacement at the EEO, as the new TAG liaison.

23 PROSIMIAN

TAG Chair: Achim Johann (NaturZoo Rheine, Rheine, Germany) • Vice Chair: Delphine Roullet (Cotswold Wildlife Park, Burford, United Kingdom)

INTRODUCTION

The EAZA Prosimian TAG worked towards maintaining high quality EEPs under its helm and continued cooperation with recommended *in situ* conservation and research projects. The TAG evaluation confirmed the good work but also highlighted points for improvement. These areas are mostly related to guiding the individual EEPs to achieve their defined roles and goals and to shape the framework for these Population Management Programmes.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

Throughout the year, most prosimian EEPs went through the LTMP process. Both the process and the results are regarded as highly valuable roadmaps for programme management. The most complex LTMP is the one for the Black and white ruffed lemurs which comprises two EEPs for *Varecia variegata variegata* and *V. variegata subcincta*. Given high inbreeding and bleak perspectives, the LTMP identified - with contribution and support of population biologists and external geneticists and taxonomists - the need for new founders in the *ex situ* population of *V. v. subcincta*. The LTMP suggests a controlled merging of the two EEPs until further results from the genetic studies are available. As a result, there are still options for a future split or fully merged population management, but for now, we will prevent a genetic loss from extreme inbreeding. A full overview on the LTMP process and experiences made was published in Zooquaria 115.

A major step forward was made to develop BPG. The TAG published the most complex and comprehensive one: for the slow loris species with a focus on the pygmy slow loris (*Xanthonycticebus pygmaeus*) because of dedicated cooperation of the respective EEP Coordinators and external experts.

The BPG for the sifakas could make use of those developed by the AZA SSP for Coquerel's sifakas (*Propithecus*

A complex LTMP was developed for the black and white patterned ruffed lemurs (*Varecia variegata*) © Achim Johann, NaturZoo Rheine

coquereli) and the compiled and published practical case study experiences made with Crowned sifakas (*Propithecus coronatus*) in EAZA.

When the draft version of the BPG for the Mongoose lemur (*Eulemur mongoz*) was ready, the TAG facilitated an online meeting bringing together experts in husbandry and management of Mongoose lemurs from the SSP and the EEP. This collaboration was regarded as most valuable to reveal weaknesses in the husbandry of these lemurs and to improve the document that has now been approved.

ACHIEVEMENTS DURING THE YEAR

A topic to deal with was expanding space capacities for the individual EEP species – primarily for the *Eulemur* species which all need to expand or remain stable to ensure sustainable *ex situ* populations. For this purpose, guidelines for mixed-species enclosures as well as new approaches of "shared space" will be developed.

The TAG, together with the Reproductive Management Advisor, will also compile a full list of population management tools applicable for lemurs, which will be spread via the EEP Coordinators.

COLLABORATIONS

The AZA and EAZA TAG Chairs met online to discuss issues deriving from the recently defined new criteria for SSPs. So far, existing SSPs which don't fit in the new scheme will lose SSP status and support from AZA. This might have an impact on the cooperation between the regional programmes and hinder practical work when authorities don't recognise transfers as essential for the benefit of the Population Management Programmes. One species - the aye aye (*Daubentonia madagascariensis*) - needs clarification on the programme and cooperation status. The regional TAGs will work towards finding a solution so the successful informal global cooperation for this unique taxon can continue.

CONSERVATION AND RESEARCH

After the interruption caused by the COVID-19 pandemic, in-person support and guidance of the TAG's recommended *in situ* conservation and research projects resumed. However, just when you think you could continue with the efforts, one has to deal with new throwbacks. For example, the site of Helpsimus where the largest population of Critically Endangered greater bamboo lemurs (*Prolemur simus*) exists, was hit by two cyclones, causing severe damage of the infrastructure for the people living there. It was a relief that both Helpsimus and the people hit by the natural disaster were able to cope with the situation practically and financially.

ADDITIONAL COMMENTS

A comprehensive overview on the work of the Prosimian TAG, the individual EEPs, husbandry and developments of the *in situ* conservation projects is provided via the Prosimian TAG Newsletter which had two issues in 2022. The Newsletter is also available on the EAZA Member Area.

24 CALLITRICHID

TAG Chair: Eric Bairrão Ruivo (Beauval Zoo, Saint Aignan, France) • TAG Vice Chairs: Dominic Wormell (Jersey Zoo, Jersey, United Kingdom), Miranda Stevenson (Bristol Zoo, Bristol, United Kingdom) and Greg Clifton (Yorkshire Wildlife Park, Branton, United Kingdom)

INTRODUCTION

The EAZA Callitrichid TAG (CTAG) was delighted to have in-person meetings again: a two-day closed meeting in Beauval Zoo (France) at the end of March; and closed and open meetings at the EAZA Annual Conference in September. The CTAG manages 17 EEPs and five monitored species.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

There were changes in the composition of the CTAG during the year. Greg Clifton (Yorkshire Wildlife Park, UK) became a Vice Chair and will take over from Eric Bairrão Ruivo (Beauval Zoo) as CTAG Chair in the second half of 2023. Kelly-Anne Kelleher (supported by Twycross Zoo, UK) resigned as EEP Coordinator for the invasive marmosets: Common marmoset *(Callithrix jacchus*) and Black-tufted-ear marmoset (*C. penicillata*). We are hopeful that will we fill this role early in 2023. Andrew Hope (Belfast Zoo, UK), after many years, resigned as Coordinator for the Pygmy marmoset EEP. Dave Rich (Newquay Zoo, UK), stepped into this vacancy and should be confirmed as the EEP Coordinator early in 2023. Nic Dunn (Monkey World, UK) resigned as he moved to Wellington Zoo (New Zealand), and Luc Lorca (Asson Zoo, France; non-EAZA) took over all 'monitored' species for the CTAG. We extend out

thanks to Kelly-Anne, Andrew and Nic for all their work on these programmes over the years.

Nic was also our Communication Advisor and Kelly-Anne now chairs our merged groups on Communication, Marketing and Education.

Brexit continued to cause serious issues regarding animal movements to and from the UK.

Programme evaluations continued with check-ins and LTMP sessions. The CTAG is very grateful to the Population Management team at the EEO for providing the help and expertise for these, in particular María Balcázar. By the end of 2022, ten LTMPs were completed and are available on the TAG page.

All Studbooks have now migrated to ZIMS for Studbooks which involved a considerable amount of work for Coordinators.

Some annual reports and Studbooks were produced and are all on the TAG page, as are all meeting minutes and reports.

White-footed tamarin (*Saguinus leucopus*) © Pierre Guibert

ACHIEVEMENTS DURING THE YEAR

A Nutrition Working Group was formed under the leadership of Dom Wormell (Jersey Zoo, UK).

Three editions of the TAG newsletter were produced. The Facebook page achieved an amazing 2.2 K members, much of this due to the popularity of the virtual talks.

A major achievement was the publication of the revised and updated BPG: these contained updates for many sections including species pages; and new sections on UV lighting, transport, off-show areas and animal training. The guidelines are available on the EAZA website under 'EAZA Documents' and on the TAG page.

CONSERVATION AND RESEARCH

Research publications and listings are on the CTAG page in the Member Area under 'research' and reported in the TAG enews. The research into wasting disease in pied tamarins (*Saguinus bicolor*) lead by Thierry Petit (Zoo de la Palmyre, France) and Dominic Wormell continued but more responses from holders are required.

The CTAG continued to support eight species in field projects in Brazil and Colombia.

Progress was made with the CTAG fundraising plan, and this should now be finalised and published in 2023.

More funds for Proyecto Tití were raised by the Primate Society of Great Britain (UK) and an article was published in the newsletter Primate Eye on the education project which aims to discourage the keeping of the species as pets in Colombia.

Dominic Wormell and Eric Bairrão Ruivo attended the official opening of the Breeding Centre for Mountain Marmosets: buffy-tufted-ear marmoset (*Callithrix aurita*) and buffy-headed marmoset (*C. flaviceps*) at Viçosa University (Brazil). The first eight units have been completed and large pre-release units are under construction. There have been several successful births already at the centre which is fantastic.
There is now an education programme and work has commenced on sterilising invasive specimens and hybrids. Important survey work continues to find the last remaining populations of both mountain marmoset species. Eric returned at the end of the year to film the Mountain Marmoset Project for a French TV company.

They then travelled to Colombia to visit the cotton-top tamarin (*Saguinus oedipus*) project, Proyecto Tití at El Ceibal and to catch up on the amazing work carried out by Rosimira Guillan and her team. After that, they attended a strategic planning and husbandry workshop for the endemic white-footed tamarin (*Saguinus leucopus*) at Piscilago Zoo (Colombia). ALPZA has adopted the species as one of its 15 focal species for the region. A wonderful presentation was given on the area of land that was purchased by the project some years ago for the protection of the species, the area is almost completely forested now. Outcomes from the workshop included: plans

for an updated field survey and another workshop focused on husbandry and rescue centre protocols; closer management and working through the issues of the *ex situ* population; and the production of a new action plan for the species.

ADDITIONAL COMMENTS

These articles were published in 2022:
Catenacci, L., et al. (2022). *Golden-headed Lion Tamarins, Leontopithecus chrysomelas (Kühl, 1820): 27 Years of Experience in Methods for Their Capture and the Collection of Biological Materials*. Primate Conservation, 37: 1-13
Fry, B.M., et al. (2022). *After short interbirth intervals, captive callitrichine moneys have higher infant mortality*. iScience, 25 (1)
Stevenson, M., Savage, A. and Guillen R. (2022). *Captive cotton-top tamarins: pets and zoos.* Primate Eye 136: 34-37

25 LARGER NEW WORLD MONKEY

TAG Chair: Adrian Baumeyer (Basel Zoo, Basel, Switzerland) • Vice Chairs: Warner Jens (Apenheul, Apeldoorn, the Netherlands) and Steven van den Heuvel (Overloon Zoo, Overloon, the Netherlands)

INTRODUCTION

The EAZA Larger New World Monkey (LNWM) TAG manages the larger species of New World Monkeys, excluding the callitrichids. Currently the TAG manages programmes for 12 species of South American primates. These include several smaller programmes of approximately 50 animals up to our largest EEPs, such as for squirrel monkeys (*Saimiri* spp.) with over 1,000 living individuals. To make sure there is enough space for all the species within the EAZA region, the EEP Coordinators work together as much as possible and encourage zoos to house species in mixed species exhibits.

During the EAZA Annual Conference in September the new team of (Vice) Chairs had the opportunity to present their new strategies to address persistent problems in the TAG. With COVID-19 and its associated challenges behind us, we are eagerly looking forward to the future.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

Brexit remained a struggle for most of the EEPs as regulations of how to move animals to and from the UK are still vague at best. Only limited numbers of animals were moved between the UK and the rest of Europe. Brexit introduced new challenges for most of the EEP Coordinators, as realistic recommendations accounting for it needed more effort on their side.

During 2022 we appointed a new EEP Coordinator for the Black howler monkey (*Alouatta caraya*). Marta Zając-Ossowska (Wrocław Zoo, Poland) handed over the programme to Jessica Aldred (Twycross Zoo, UK). We would like to thank Marta for all the work she put into the programme and into the TAG.
We started the first preparations for the RCP process for the LNWM TAG that will hopefully take place in 2023. After the RCP is published, LTMPs will follow for all EEPs.

ACHIEVEMENTS DURING THE YEAR

This year marked the start of the new (Vice) Chair team. During 2022, we set the directions in which we would like to develop the TAG in the upcoming years. We decided to separate the responsibilities for the programmes among the Chair and Vice Chairs. We hope that we can insure smoother communication between the EEP Coordinators and the TAG. Steven van den Heuvel (Overloon Zoo, the Netherlands) oversees the Capuchin, Saki and Titi EEPs, Warner Jens (Apenheul, the Netherlands) the Spider and Howler monkey EEPs, and Adrian Baumeyer (Basel Zoo, Switzerland) the Squirrel and Night monkey EEPs.

For several species, animals needing to be outplaced remain a challenge, especially for males. Therefore, the TAG will work on guidelines to keeping LNWM species in mixed species exhibit, to acquire new holders and hopefully ease the problem a bit.

Populations of most of the species remained stable over the last year.

COLLABORATIONS

We are working towards increasing collaboration with other regions, especially the AZA region as some species are managed in SSPs and we do not recommend keeping them in the EAZA region. This collaboration already led to genetically important exchanges in the past years. As AZA changed its population management structure recently, this collaboration might become even more important. Once the LNWM TAG RCP is published, we can look into new forms of collaboration with our North American colleagues.

CONSERVATION AND RESEARCH

We are still looking for, and evaluating, good *in situ* conservation projects to add to the ones already endorsed by the TAG. We encourage holders of these species to lend

Woolly monkey (*Lagothrix*) © Zoo Basel

their support. Not all species managed through the LNWM TAG are of direct conservation value. However, considering the large number of Endangered New World species, there is a wide array of conservation projects that can (and should) be supported by EAZA Members.

Several research projects are ongoing, namely for the distinction of subspecies and we urge holders to provide DNA samples of their animals to get insight of the genetic make-up of several EEP populations. Furthermore, various ethological studies are carried out in different institutions and with different species.

26 AFRO-EURASIAN MONKEY

TAG Chair: Tjerk ter Meulen (Artis Zoo, Amsterdam, the Netherlands) • Vice Chair: Andrea Dempsey (Heidelberg Zoo, Heidelberg, Germany)

INTRODUCTION

The EAZA Afro-Eurasian TAG wishes to thank all its EEP Coordinators, TAG members, Species Committee members and Advisors that have made managing the 27 programmes possible. We are grateful to you and the institutions for your support through 2022.

We were delighted to be reunited this year at the EAZA Annual Conference which saw both a closed and open meeting for the TAG. The open meeting was well attended and hosted a number of interesting presentations: Achim Johann (NaturZoo Rheine, Germany) gave insights into implementing a LTMP for Gelada baboons (*Theropithecus gelada);* Jesús Recuero (Bioparc Fuengirola, Spain) spoke about the status and plans for the Talapoin monkey (*Miopithecus ogouensis*); Emile Prins (GaiaZOO, the Netherlands) gave a presentation on the reversibility of contraception in male black crested mangabeys (*Lophocebus aterrimus*). the TAG Vice Chair gave an update on the global management of the Diana monkey (*Cercopithecus diana)*; on behalf of Malene Friis Hansen (IUCN SSC Primate Specialist Group, PSG) the TAG Chair gave a presentation on the Long-tailed macaque (*Macaca fascicularis*) Project and lastly the meeting heard about important Guinea baboon (*Papio papio*) field work.

The closed TAG meeting was equally well attended. We had two guest presentations: Lorraine Scotson, CEO of the Saola Foundation for Annamite Mountains Conservation (USA), and Rafaela Fiuza (Lisbon Zoo, Portugal) and Christina Hvilsom (Copenhagen Zoo, Denmark) discussing primate fertility and reproduction, including the importance and practicalities of collecting samples. The EAZA Population Management team gave a presentation on the upcoming LTMPs for the TAG, and we had good discussions on the implications of the new AZA restructure and individual programme developments.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

Six LTMPs were undertaken in 2022. The EEP which went through this experience were: Owl-faced monkey (*Cercopithecus hamlyni*), Hanuman langur (*Semnopithecus priam*), L'Hoests monkey (*Allochrocebus lhoesti*), Northern Talapoin monkey (*Miopithecus ogouensis),* Debrazza monkey (*Cercopithecus neglectus)* and Roloway monkey (*Cercopithecus roloway*). The process will continue into 2023.

Young geladas (*Theropithecus gelada*) © Achim Johann, NaturZoo Rheine

ACHIEVEMENTS DURING THE YEAR

The TAG Chair and Vice Chair were pleased to receive a travel grant each to attend the joint TAG Chairs meeting in Palm Springs (USA). It was a great opportunity to meet with our counterparts, discuss common issues and find solutions together.

Thanks to Yorkshire Wildlife Park (UK) for hosting the Afro-Eurasian Monkey Workshop. The two-day workshop saw keynote presentations given by Jo Setchell (Durham University, UK) on mandrill behavioural ecology to decolonising primatology, and Holly Farmer (Paignton Zoo, UK) on primate populations including breed and cull. There were also presentations on guenon introductions, breeding management and a final session on conservation projects in Java, Morocco and Ghana. Participants had the opportunity to talk inclusively about the taxon, and share experiences and knowledge in a welcoming environment.

COLLABORATIONS

Our TAG members collaborate with a number of external institutions such as Barcelona University (Spain), University of Rennes (France) and IUCN SSC PSG. The TAG has collaborated on a number of information sheets produced by the PSG Section on Human-Primate Interaction on topics such as the primate pet trade, and guidelines for primate tourism. For instance, *Why Primates Make Bad Pets* available on human-primate-interactions.org.

CONSERVATION AND RESEARCH

The TAG throughout 2022 continued to support a number of conservation programmes and encourages all holders of Afro-Eurasian monkeys to do so. It is recommended for example that:

- all mangabey species and roloway monkey holders support WAPCA (West African Primate Conservation Action, Ghana, www.wapca.org). Mangabey holders are also recommended to support Limbe Wildlife Centre in Cameroon (www.limbewildlife.org)
- Sulawesi crested macaque (*Macaca nigra*) holders support the Selamatkan Yaki project (Indonesia, www.selamatkanyaki.ngo)
- Barbary macaque (*Macaca sylvanus*) holders support Barbary Macaque Awareness & Education Conservation (Morocco, www.barbarymacaque.org)
- Drill (*Mandrillus leucophaeus*) holders support Save The Drill (Germany, www.save-the-drill.org)

This year WAPCA will also be looking to support conservation work for both the patas monkey (*Erythrocebus patas*) in relation to the pet trade and Diana monkey, and work in the Tai National Park in Cote d'Ivoire. All holders are encouraged to discuss support with them (andrea.dempsey@wapca.org).

ADDITIONAL COMMENTS

The TAG would encourage all institutions to consider adding Afro-Eurasian monkeys recommended in the RCP to their collection plans; they mix very well with other species of primate and hoofstock for which there are guidelines available. Many of the managed programmes have *in situ* project partners that link directly to the species in the wild, which institutions could support promoting the One Plan Approach.

Lastly, we would like to take this opportunity to thank María Teresa Abelló (Barcelona Zoo, Spain), Coordinator for the Cherry-crowned and White-naped mangabey EEPs, who is retiring in 2023, for her all her hard work. María Teresa has been instrumental in the TAG, generous with her time and support and will be very much missed.

27 GIBBON

TAG Chair: Brice Lefaux (Mulhouse Zoo, Mulhouse, France) • Vice Chair: Matt Ford (Howletts Wild Animal Park, Canterbury, United Kingdom)

INTRODUCTION

The EAZA Gibbon TAG manages six EEPs: the Siamang (*Symphalangus syndactylus*), two Crested gibbons (*Nomascus leucogenys and N. gabriellae*) and three Hylobates (*Hylobates moloch, H. pileatus and H. lar*). All species are threatened by deforestation and poaching in the wild. They are all listed as Endangered or Critically Endangered species on the IUCN Red List. The Gibbon TAG is composed of the TAG Chair and Vice Chair, six EEP Coordinators, one Vet Advisor, one Research Advisor, one Communication Advisor and the Vice Chair of the IUCN Primate Specialist Group Small Ape Section, who functions as the *in situ* conservation liaison.

Silvery gibbon (*Hylobates moloch*) female and offspring
© Howletts Wild Animal Park

2022 was mainly marked by difficulties and the prolonged delay of animal transfers for some institutions due to COVID-19 and Brexit.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

There were no specific changes to the EEPs in 2022. Matt Ford (Howletts Wild Animal Park, UK) was reinstated as TAG Vice Chair in the early part of 2022.

A Gibbon TAG meeting was held at the EAZA Annual Conference in September 2022 which was attended by most of the TAG members.

ACHIEVEMENTS DURING THE YEAR

The roles of the Gibbon EEPs are similar for all. Because extinction in the wild is deemed realistic considering the *in situ* status, they function as insurance populations, as well as to raise awareness of the threats to the species and educate on the use of primates as photo-props. EEPs enable research that may benefit the *in situ* population and fundraise

for identified projects. There is a shortage of structurally appropriate institutional space for all Gibbon EEPs and most species have a skewed (birth) sex-ratio. Each EEP aims to improve their potential to fulfil their insurance role, while at the same time normalising the space situation and improving the sex-ratio.

The important components of the LTMP strategies are to increase the available institutional space, continue to work with institutions to find options to house males, to potentially influence the birth sex-ratio, to investigate the use of cryopreservation to maintain genetic diversity, and to collaborate with rescue centres and other regions to complement the EEP and place individuals.

There have been some issues with transport relating to Brexit which has made importing and exporting gibbons to and from the UK much harder. This has potentially delayed existing recommendations while new paperwork is worked through and may cause issues in some of the TAG's smaller programmes. All institutions are working together to find a solution to this.

The Gibbon TAG produced the latest RCP. This document is a comprehensive strategy that all holders and the TAG can work towards. The BPG are nearing completion after a great deal of work by all TAG members; this document will be ready in 2023. As a TAG we thank all holders for their continued support and following of EEPs' breeding recommendations.

CONSERVATION AND RESEARCH

Since 2021, the Gibbon TAG collaborates with Wageningen University (the Netherlands) and the EAZA Population Management Centre to test the different hypothesis of gibbon biased sex ratio.

The Gibbon TAG still needs all gibbon holders to enter their data in the EAZA Conservation Database to assess and promote the conservation contribution of EEP participants. TAG members are encouraged to contact and support the following gibbon *in situ* conservation programmes:

- Association Anoulak, Nakai Nam Theun National Park in Laos (www.conservationlaos.com)
- Endangered Primate Rescue Centre, Cuoc Phong National Park in Vietnam (www.eprc.asia)
- Angkor Centre for Conservation of Biodiversity, Cambodia (www.accb-cambodia.org)
- Cao Vit Gibbon Project, Flora and Fauna International, Vietnam (www.fauna-flora.org/projects/transboundary-cao-vit-gibbon-conservation-cao-bang-province)
- Borneo Nature Foundation, Indonesia (www.borneonaturefoundation.org)
- Yellow-cheeked Crested Gibbon Project, Vietnam, by Frankfurt Zoological Society and Stiftung Artenschutz, (www.stiftung-artenschutz.de)
- Huro, India (https://en.lepal.com/commit/page/le-pal-natures-foundation)
- Javan Primates Project, Indonesia (www.aspinallfoundation.org/the-aspinall-foundation/working-around-the-world/indonesia)

28 GREAT APE

TAG Chair: María Teresa Abelló (Barcelona Zoo, Barcelona, Spain) • Vice Chairs: Sandra Reichler (Heidelberg Zoo, Heidelberg, Germany) and Claudia Rudolf von Rohr (Zürich Zoo, Zürich, Switzerland)

INTRODUCTION

In 2022, a slow return to normal of the EAZA Great Ape TAG activity was possible. EEPs are still suffering from the two years of pandemic that have been very difficult for zoos and have had a negative impact on the improvement of facilities and animal transfers, mainly due to economic problems. However, the great ape populations managed in the TAG are still in good health. These *ex situ* populations play an important role in the conservation of the species, and their existence can be a valuable conservation asset from a holistic One Plan Approach.

2022 was also a year of change. We said goodbye to two dear and important members of this TAG: Clemens Becker (Karlsruhe Zoo, Germany) who retired at the end of 2022, and Tom de Jongh (Royal Burgers' Zoo, the Netherlands) who had his last year as Vice Coordinator of the Chimpanzee EEP but will stay as an Advisor to this EEP housing group. The TAG thanks them both for their many years of good work.

From 2022, we have two new Vice Coordinators for the Chimpanzee EEP, Arun Idoe (Royal Burger's Zoo) and Laetitia Latorre (Beauval Zoo, France), and a second Vice Chair for the TAG, Claudia Rudolf von Rohr (Zürich Zoo, Switzerland).

I would like to take the opportunity to say goodbye as Chair of this TAG, as I will also be retiring at the end of March 2023. I would like to thank all the (Vice) Coordinators, Advisors, TAG members and of course Sandra Reichler (Heidelberg Zoo, Germany) for their collaboration, help and patience during all these years of cooperation and work. It has been a wonderful experience and without all of them, we would not have achieved the results of these years. I would also like to express my personal thanks to the EEO who in a very kind, efficient and professional way help us day by day in our work.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

Over the past year, we have been able to produce the RCP for Great Apes, which sets out the general guidelines for each species – orangutans (*Pongo* spp.), gorillas (*Gorilla gorilla*), chimpanzees (*Pan troglodytes*) and bonobos (*Pan paniscus*) - for the next five years.

The Great Ape TAG considers all great ape species important, and aims for healthy, self-sustainable populations for all great apes managed in human care. The TAG encourages all holders to contribute to conservation activities for the species that fall under its remit and to include their support in the EAZA Conservation Database. The main roles for all managed species in this RCP include direct conservation roles for education, research, insurance, fundraising and capacity building, and indirect conservation roles for education and

Chimpanzee (*Pan troglodytes verus*) © Monika Vlčková, Ostrava Zoo

advocacy, as well as non-conservation roles for biological education and basic and applied research.

The main concerns identified are the following:

- The current Western gorilla EEP population size is being maintained. In the coming decades, however, there is still a need for more holders and flexibility to hold individual males, as explained in the recent LTMP
- The Bornean and Sumatran orangutan EEPs have a need for additional options to house males in particular, which can be achieved through new holders as well as through the redesigning of existing enclosures to allow more flexibility. Once all existing males are housed, there should be no more space challenges in the future, as the population size is being maintained
- For the Chimpanzee EEP, several holders would like to eventually stop with the species, often because it is not feasible to upgrade their existing facilities. At the same time, the total population size is decreasing with hundreds of individuals in the coming 20 years because the population is aging and there is no breeding with hybrid chimpanzees. The challenge instead will be to merge remnant groups, which requires more flexible enclosures
- The Bonobo EEP is at capacity right now, but it is expected that a few new holders can join the EEP over the coming 15 years to allow the population size to grow from the current 145 to 200 individuals. The EEP aims to find five more EAZA Members interested to keep bonobos in the coming ten to fifteen years, to create enough institutional space to hold around 200 bonobos within EAZA

In general, institutions that hold bachelor groups and have flexible enclosures allowing to care for more adult males and to introduce new individuals are crucial for the stability of the populations and the success of the Great Ape TAG. In fact, the TAG can only be successful if all EEP participants do their part, which is why all EEP participants are asked to contribute to holding the entire population.

The LTMP for Bonobos was published. The LTMPs for Orangutans and Chimpanzee were published in 2018 and will need to be reviewed soon. With the publication of the Chimpanzee BPG, all the species have now their BPG openly published on the EAZA website.

ACHIEVEMENTS DURING THE YEAR

The Conservation Education group is just settling in. We are aware of the importance of communicating clearly and transparently about all the work we do for the good of the species and the individuals in our care. We believe it is very important to show that "great apes are so similar to humans but yet so different" and this message needs to reach communication/marketing departments, zoo managers, education departments, keepers and, of course, visitors. We also need to explain how we work by applying science, experience, and empathy, taking the best care possible for the great apes in EAZA, and supporting/funding *in situ* conservation programmes. We are working on this, and we hope to be able to act soon and get us good results.

Animal welfare is a much-used word nowadays, but it has always been present in our management of populations and individuals. In the last decades, there have been substantial improvements in facilities, diets, and management thanks to ethological and veterinarian knowledge. However, there is always room for further improvement, and the Great Ape Welfare Working Group is trying to identify welfare indicators that help us to improve the conditions in which we keep great apes in EAZA, as well as their management of *ex situ* populations. A general chapter about welfare and training is already ready for its inclusion in the BPG for all great ape species.

Finally, we can mention our satisfaction that the network for cryobanking seems to be in place and with a very good start. The role of a Biobank and Cryobank may be of vital importance in the uncertain future that many, if not all, species of great apes currently face.

ADDITIONAL COMMENTS

These articles are some of the ones published by members of the TAG or with their collaboration in 2022:

- Gerits, I. et al. (2022). *Semen collection, evaluation, and cryopreservation in the bonobo (Pan paniscus).* BMC Zoology, 7:12
- Moittié, S. et al. (2022). *Vitamin D status in chimpanzees in human care: a Europe wide study.* Nature portfolio, 12:17625
- Köster, P.C. et al. (2022). *Intestinal Protists in Captive Non-human Primates and Their Handlers in Six European Zoological Gardens. Molecular Evidence of Zoonotic Transmission*. Front. Vet. Sci., 8: 819887
- Mestres-Torres, C., Abelló Poveda, M.T. and Rodríguez-Teijeiro, J.D. (2022). *Morphological appearance and effects of castration on black back gorillas Gorilla gorilla gorilla in the EAZA ex situ population*. Journal of Zoo and Aquarium Research, 10(1)
- Abelló Poveda, M. T. et al. (2022). *EAZA Great Ape Taxon Advisory Group Regional Collection Plan* – First edition. EAZA Executive Office, Amsterdam, the Netherlands
- Stevens, J. et al. (2022). *EAZA Long Term Management Plan for Bonobos (Pan paniscus) EAZA Ex situ Programme (EEP)*

29 SMALL MAMMAL

TAG Chair: Richard Viduna (Jihlava Zoo, Jihlava, Czechia) • Vice Chairs: Dijana Beneta (Zagreb Zoo, Zagreb, Croatia), Dorota Gremlicová (Liberec Zoo, Liberec, Czechia), Jutta Heuer (Halle Zoo, Halle, Germany), Johannes Pfleiderer (Leipzig Zoo, Leipzig, Germany), and David White (Chester Zoo, Chester, United Kingdom)

INTRODUCTION

The EAZA Small Mammal TAG supports and promotes conservation of small mammal taxa within our scope around the world – the diversity of species is represented on the TAG logo. This achievement is through *ex situ* management, conservation education, engagement in *in situ* management and conservation programmes, and advocacy for these taxa, both in human care and in the wild.

The TAG structure comprises six subgroups, each having its own responsible person:

- subgroup Afrosoricida, Macroscelidea, Tubulidentata, and Hyracoidea (golden moles and tenrecs, elephant shrews, aardvarks, and hyraxes) managed by Richard Viduna (Jihlava Zoo, Czechia)
- subgroup Chiroptera (bats) managed by David White (Chester Zoo, UK)
- subgroup Erinaceomorpha, Soricomorpha, and Scandentia (hedgehogs, moles and shrews, and treeshrews) managed by Dijana Beneta (Zagreb Zoo, Croatia)
- subgroup Hystricomorpha (cavies, porcupines, and gundis) managed by Dorota Gremlicová (Liberec Zoo, Czechia)
- subgroup Lagomorpha, Myomorpha, Sciuromorpha, and Anomaluromorpha (mice and rats, squirrels, and springhares) managed by Johannes Pfleiderer (Leipzig Zoo, Germany)
- subgroup Pholidota and Xenarthra (pangolins, sloths, anteaters, and armadillos) managed by Jutta Heuer (Halle Zoo, Germany)

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

Two new species for monitoring were officially established in 2022, i.e. round-eared elephant shrew (*Macroscelides proboscideus*) and spinifex hopping mouse (*Notomys alexis*).

The first of four planned RCP workshops covering the subgroup Pholidota and Xenarthra, was hosted by Frankfurt Zoo (Germany) on 16-17 May 2022. This meeting was the first, in-person meeting of its kind within EAZA since the COVID-19 pandemic. The workshop was held as a hybrid meeting as certain restrictions were still in place, with several participants joining online. *In situ* and *ex situ* experts from Europe, Asia and South America collaborated to examine the status and future prospective of all included taxa. The second RCP workshop covering the subgroup Chiroptera was due to take place in early 2023. Due to liaison change within the EEO this will be deferred to later in 2023.

Balkan snow vole (*Dinaromys bogdanovi*) at Zagreb Zoo © Dijana Beneta

On-site participants of the Regional Collection Plan workshop for pholidotans and xenarthrans hosted at Frankfurt Zoo © Grit Liehr

ACHIEVEMENTS DURING THE YEAR

The TAG mid-year meeting was also hosted by Frankfurt Zoo, from 17 to 20 May. Because of ongoing COVID-19 restrictions, sadly only 45 participants registered, from 11 countries. Those participants were presented with interesting lecture sessions, inspiring tours of Senckenberg Natural History Museum Frankfurt, Opel-Zoo and Frankfurt Zoo (all Germany), and delicious local culinary delights. An auction was part of the farewell party with an amazing € 1,500 raised to support Ukrainian zoos. Once again, we wish to express our gratitude and thanks to all the staff at Frankfurt Zoo for hosting both meetings.

The TAG annual meeting was held at the EAZA Annual Conference in Portugal. More than 100 attendees heard presentations covering all the subgroups. These updates included Xenarthran conservation in Brazil and black and rufous elephant shrew (*Rhynchocyon petersi*) husbandry to name just two.

The Chair and Vice Chairs met online to discuss current topics and ideas to continually evolve our TAG.

The "EAZA Small Mammal TAG working space" Facebook group has provided a useful platform to share information and news on small mammals, reaching a membership of 1,800 already.

COLLABORATIONS

After a few years, regular contact and cooperation with Bundesarbeitsgruppe Kleinsäuger, a voluntary association of small mammal enthusiasts, mostly from German-speaking counties, was re-established. Their Chair Christian Montermann introduced this society to us in detail during the mid-year meeting.

CONSERVATION AND RESEARCH

A new conservation project for the Bavarian pine vole (*Microtus bavaricus*), one of most threatened European mammal species, was recently established in Alpenzoo Innsbruck (Austria). The main goals of the project are to build a secure *ex situ* population, collect data and provide the necessary research, including raising public awareness, about this unknown taxon and its vanishing habitat. These enigmatic and rare rodents seemed to be endemic to Bavaria, Germany, and Northern Tyrol, Austria. Despite intensive field research, only one population was confirmed in the northern corner of the Rofan Mountains. The species, classified as Critically Endangered by IUCN, was found in 1962, and considered lost until its re-discovery in 2000. The first animals arrived at Alpenzoo Innsbruck in September 2021 and in June 2022 two young females were born. It was the world's first breeding success in human care for the species. Following this first births, subsequent litters were born in the following months. Currently all specimens are kept in an off-show breeding facility. In 2023 a public display is planned to showcase these creatures, which will be exhibited in the new "Untertierisch", which presents life of underground animals.

The Balkan snow vole (*Dinaromys bogdanovi*) is an endemic and relict taxon, specific to the karst area of Dinaric Alps. Due to the poor knowledge of the species biology, unknown population density, indirect competition with European snow vole (*Chionomys nivalis*) and human intrusion which additionally isolate their population, it is classified as Vulnerable by IUCN. Because of their habitat concealments and neophobic behaviour, any study of these rodents in nature is very challenging. Zagreb Zoo, in cooperation with several partners, conducted *ex situ* research which resulted in the development and evaluation of several different observation methods possibly applicable for *in situ* use. In 2022 photo traps and footprint traps were tested both in the zoo and in the field. The "capture-mark-recapture" method is planned to be used in 2023 with emphasis on correct determination, detailed measuring, and DNA sampling of every handled specimen. This project was presented during the EAZA Conservation Forum 2022.

ADDITIONAL COMMENTS

The third edition of "The Roost", the online bat e-newsletter, was circulated to all the TAG members.

The paper *Mortality and morbidity in captive Livingstone's fruit bats Pteropus livingstonii* authored by Segura-Cortijos, C. et al. was published in EAZA's Journal of Zoo and Aquarium Research, 10(2) in 2022.

30 CANID AND HYAENID

TAG Chair: Simon Marsh (Knowsley Safari Park, Prescot, United Kingdom) • Vice Chairs: Mike Woolham (Blackpool Zoo, Blackpool, United Kingdom) and Sarah Forsyth (ZSL London Zoo, London, United Kingdom)

INTRODUCTION

Whilst the EAZA Canid and Hyaenid TAG continue to make the most of online communication for regular updates and discussions, we took advantage of being able to meet in person and planned two meetings at the EAZA Annual Conference in Portugal, both of which were very well attended. We continue to work closely with the EAZA Population

Management Centre to achieve LTMPs and seven of our 10 programmes now have them either completed or in progress, with the final programmes working towards completion by the end of 2023.

In situ conservation activities started to pick up following on from the end of the pandemic and *in situ* and *ex situ* research outputs continue to be high.

The TAG newsletter published two issues in 2022 and the EAZA Canid and Hyaenid TAG Facebook page continues to grow with over 2,500 followers. All our publications, resources and proceeding from conferences can be accessed through the TAG workspace on the EAZA Member Area.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

In 2022 we saw some further changes to the EEP for Painted dog (*Lycaon pictus*) which resulted in a new Coordinator but at the same institution, so expertise and a good understanding of the management of the programme has not been lost. Several key staff within the TAG changed institutions during 2022 but all were able to take their programmes or roles with them and all have had TAG and EEP Committee approval to continue.

ACHIEVEMENTS DURING THE YEAR

Following on from the initial online meetings in 2021, LTMPs were published for the bat-eared fox (*Otocyon megalotis*), Iberian wolf (*Canis lupus signatus*), bush dog (*Speothos venaticus*), and maned wolf (*Chrysocyon brachyurus*) and online check-ins were completed for the grey wolf (*Canis lupus*), dhole (*Cuon alpinus*) and fennec fox (*Vulpes zerda*).

We held both open and closed meetings at the EAZA Annual Conference. The open meeting covered hormone and reproductive research projects on painted dogs and a discussion on pack management and the challenges around social interactions and aggression in canids and hyaenids, with some interesting case studies presented and discussed. During the closed meeting, we talked about ways to speed up the delivery of BPG and to further increase support for TAG members and improve communication. The evaluation for the TAG was completed, with overall positive results and provided some clear feedback on how and where we can improve.

COLLABORATIONS

The TAG continues to collaborate with the Institute for the Breeding of Rare and Endangered African Mammals regarding *in situ* and *ex situ* research. We also work with other NGOs and academic institutions to support research and *in situ* conservation projects, such as the IUCN Canid SG and Sparsholt University College (UK). The partnership with the IUCN Canid SG has seen the development of an *in situ* conservation initiative where small projects are identified through a review process and then promoted through the

Iberian wolf (*Canis lupus signatus*) © Terra Natura Murcia

TAG and EEP network. This will generate funds and support for small projects which struggle to find funds through traditional avenues.

CONSERVATION AND RESEARCH

The research outputs for the TAG's Research Advisors and the EEP Coordinators continues to be impressive, with several projects started or completed in 2022. Here are a few examples of the research undertaken during the year:

- Passion on stilts – maned wolf introductions
- Do actions and beliefs of zookeepers influence the behaviour of grey wolves in human care?
- Co-occurrence of high densities of brown hyena (*Parahyaena brunnea*) and spotted hyena (*Crocuta crocuta*) in central Tuil, Botswana
- When a habitat becomes a home: Housing and husbandry of spotted hyena
- Survey of Grey wolf enclosure design in EAZA collections
- Neurological disorders of polar canids (*Vulpes lagopus* and *Canis lupus*) under human care
- Review of feeding, husbandry, reproductive and medical management of maned wolves in zoos
- Feeding regimen and growth comparison in two related African painted dog litters
- Captive rearing of orphaned African painted dogs in Namibia: a case study

The Coordinator for the Iberian wolf EEP appointed a Reproduction Advisor to the EEP, following on from discussions held during the LTMP, where it was highlighted that one of the challenges is the reversibility of individuals who have been implanted, and the loss of genetic lines. Together with the Vet Advisor they will be working on two studies, one about hormone monitoring in implanted animals and the other cryopreservation of gonadal tissue.

There were several successful activities of the maned wolf conservation programme in Brazil during 2022 including a population inventory using over 60 camera traps in three different locations where numbers exceeded 700 maned wolf photos and videos as well as the behavioural rehabilitation of four puppies that were rescued and reintroduced back to the wild.

ADDITIONAL COMMENTS

During 2022 our Education Advisor continued to work on and implement the TAG Education Strategy. The steps identified in the strategy were to first assess the current landscape of education provision for the TAG species as well as public perception of hyenas and canid species across the EAZA region and their natural range countries. A survey has been developed and shared with holders to help establish a picture of what education efforts are underway and this will allow us to build a plan and support activities going forward. This strategy is key for the TAG to support EAZA Members and their *in situ* conservation partners in developing their own education policies and resources to help tackle the ingrained perceptions of hyenas and wild dog species in zoos and in the wild, and one of the ways we plan to do this is by producing and sharing a best practice guide for conservation education.

31 BEAR

TAG Chair: José Kok (Ouwehands Zoo, Rhenen, the Netherlands) • Vice Chair: Will Walker (Wild Place, Bristol, United Kingdom)

INTRODUCTION

The EAZA Bear TAG had several constructive meetings during the pandemic, which were a great use of technology; however, the chance to all meet up again in person in Portugal for the EAZA Annual Conference was fantastic. This opportunity to see each other in person again, present to an actual room full of people, and of course socialise with our colleagues was great fun.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

After two online meetings early 2021, the Bear TAG RCP report was finalised in August 2022 thanks to intense and constructive meetings.

We had participants from all over the world: Bear TAG

Brown bear (*Ursus arctos*) © Ouwehands Zoo

Chairs, all EEP Coordinators, Studbook keepers, TAG Advisors, Programme Advisors, IUCN SSC Bear SG members, Free the Bears (UK), Wildlife SOS (India), AZA Bear TAG Chair and Vice Chair, *in situ* experts from China, North America, Europe and India and of course the whole exercise was led by colleagues from the EEO.

We thought that having to cover only eight bear species was an easy thing to do. But in the end, we had to organise a second meeting to revisit the Asiatic black bear (*Ursus thibetanus*).

The RCP report proposed the following:

- Six EEPs for Brown bear (focusing on *U. arctos* and *U. a. syriacus*), Polar bear (*Ursus maritimus*), Sun bear (*Helarctos malayanus*), Sloth bear (*Melursus ursinus*), Andean bear (*Tremarctos ornatus*), and Asiatic black bear
- One Mon-T REPLw for American black bear (*Ursus americanus*)
- One Mon-T Phase out for Giant panda (*Ailuropoda melanoleuca*)

Within the Bear TAG we face serious space issues due to the biology of bear species. In our meetings we tried to work on: 'How we hope to improve bear conservation through better collaboration and communication, and how we can we tackle the space issue for bears in human care.' This was also presented during at the EAZA Annual Conference in Portugal.

The revision of the LTMP for polar bears was completed in summer 2022. Right now, the TAG is working on some of the issues that came out of this meeting:

- A Polar Bear Research Master Planning Workshop is scheduled for March 2023. In this session we aim to lay the groundwork for the production of a prospectus summarising the research priority topics for the species, such as the one that exists for sun bears (*Priority topics for ex situ sun bear conservation research*, available on the Bear TAG page of the EAZA Member Area)
- A Polar bear Husbandry Conference is scheduled for January 2024

ACHIEVEMENTS DURING THE YEAR

We are happy to have finalised our RCP and the LTMP for polar bears. Progress was also made on the EAZA Bear TAG Education Handbook as the TAG Educator received some support. It will be out in 2023.

COLLABORATIONS

The Bear TAG has had long lasting strong connections with the IUCN SSC Bear SG for many years now and the cooperation is continuing with the AZA Bear TAG and all *in situ* partners.

CONSERVATION AND RESEARCH

The Bear TAG endorsed the research initiated by the Sun bear EEP: Reproduction evaluation for the species was involved in the study.

Through our conservation partners, there is ever lasting support for conservation projects of sun bear, sloth bear, polar bear, Andean bear, and brown bear.

32 SMALL CARNIVORE

TAG Chair: Aude Haelewyn-Desmoulins (Reynou Zoo, Le Vigen, France) • TAG Vice Chairs: Janno Weerman (Rotterdam Zoo, Rotterdam, the Netherlands) and Peggy Rüegg-van den Broek (Papiliorama, Kerzers, Switzerland)

INTRODUCTION

The EAZA Small Carnivore TAG (SC TAG) covers eight families with a total of 167 species. It has 37 TAG members: 27 core members, three Advisors in conservation, one in nutrition, and two general Advisors, in addition there are specified Coordinators for research, education and engagement. One member is appointed as liaison with the EAZA Animal Welfare Working Group.

At the end of 2022, the TAG managed eight EEPs and monitored 36 species and subspecies.

Two in-person meetings were held in 2022 at the EAZA Annual Conference in September.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

Following the workshop held in January 2021, the RCP for small carnivores was reviewed by the TAG members in April 2022 and approved by the EEP Committee in June. First steps to implement it were taken, leading to a higher number of species under better-targeted management, like, for example the creation of a new style EEP for the Meerkats (*Suricata suricatta*).

The EEP Committee approved Vice Coordinators for the Fossa and Giant otters EEPs: respectively, Sandra Dollhäupl (Duisburg Zoo, Germany) and Kim Skalborg Simonsen (Givskud Zoo, Denmark).

ACHIEVEMENTS DURING THE YEAR

The first edition of the SC TAG RCP was published in June 2022. It is available on the TAG section of the EAZA Member Area. The implementation of the RCP is in process, with the preparation of applications for 16 new style EEPs, covering 34 species. Forty-three species will be monitored by the TAG.

The development of LTMPs for 26 species is scheduled for the years to come. The second edition of the LTMP for red panda (*Ailurus fulgens*) was published in 2022, as well as the first LTMP for binturong (*Arctictis binturong*). The LTMP for giant otter (*Pteronura brasiliensis*) and meerkat are in process.

COLLABORATIONS

The 15th International Otter Congress, organised by the IUCN SSC Otter Specialist Group (OSG), was held in September 2022. The programme was developed around nine thematic sessions and 40 talks. Aude Haelewyn-Desmoulins (Reynou Zoo, France) was invited to present the outcomes of the RCP for otters' population management and conservation.

The 2nd International Giant Otter Workshop, organised by Fundación Rewilding Argentina, EEP Coordinator Tim Schikora (Schwerin Zoo, Germany), the OSG and Cali Zoo (Colombia), was held in Argentina in November. It brought together people and institutions that work in research and conservation, both *in situ* and *ex situ*. An International Giant

GPS collar calibration project run by the Max Planck Institute Department of Animal Behaviour on fossas (*Cryptoprocta ferox*) at Paris Zoo © Zea Walton, Max Planck Institute

Otter Alliance was founded under the umbrella of the OSG to address threats to the species. This alliance will notably ensure that the *ex situ* and *in situ* organisations collaborate more closely with joint conservation efforts.

In 2022, the cooperation with red panda range state countries was intensified. During a mandatory training course designed for the Indian Forest Service Officials in March, EEP Coordinator Janno Weerman (Rotterdam Zoo, the Netherlands) gave a presentation about conservation breeding and its role in conservation of endangered species.

CONSERVATION AND RESEARCH

The giant otter is, according to the IUCN, catalogued as internationally Endangered, Critically Endangered in most countries in its range of distribution and is considered to probably be Extinct in all of Argentina. The first transfer of animals (1.1) from Europe (Denmark and Hungary) to Rewilding Project in Argentina took place in 2019 and led to offspring in the pre-release enclosure in 2021. A second male was transferred from Sweden in 2021 and joined by a female from France in January 2022.

The West Bengal Zoo Authority under the Department of Forests, Government of West Bengal and Darjeeling Zoo (India) have taken up the programme for conservation breeding of red panda as well as re-stocking of declining population in Singalila National Park and Neora Valley National Park. The objective of this programme is to strengthen the wild population through release of genetically, biologically, and behaviourally viable zoo-bred red pandas, in a scientific and planned manner to help with long term conservation of the species. In 2022, three red pandas born in human care were released in Singalila National Park.
A new European mink (*Mustela lutreola*) translocation project was launched on Saaremaa Island, Estonia. Two pregnant minks were transferred to the island and released with their offspring in the summer of 2022. During the monitoring of the released minks only one death by predator was recorded and no deaths by starvation.

The cooperation between the Fossa Fund and German NGO "Chances for Nature" was continued. The reforestation of 45.5 hectares of burned dry forest in Kirindy (Madagascar) was completed in 2022 with comprehensive involvement of the local communities by planting another 19,800 seedlings.

The GPS collar calibration project, planned with the Max Planck Institute of Animal Behaviour (Germany), was successfully implemented at Paris Zoo (France), where two fossas (*Cryptoprocta ferox*) were equipped with the collars during a regular veterinary check-up procedure in autumn 2022.

ADDITIONAL COMMENTS

The TAG members were involved in the following publications:

- Haelewyn-Desmoulins, A. et al. (2022). *EAZA Small Carnivore Taxon Advisory Group Regional Collection Plan – First edition*. EAZA Executive Office, Amsterdam, the Netherlands
- Bista, D. et al. (2022). *Space use, interaction and recursion in a solitary specialized herbivore: a red panda case study*. Endangered Species Research, 47: 131-143
- Holeyachi, B. and Weerman, J. (2022). *Back to the wild. A dedicated programme in India's Singalila National Park is focusing on the conservation of the red panda*. Zooquaria, 114: 22-23
- Spiezio, C. et al. (2022). *Behaviour of Zoo-Housed Red Pandas (Ailurus fulgens): A Case-Study Testing the Behavioural Variety Index*. Journal of Zoological and Botanical Gardens, 3(2): 223-237
- Gray, R. et al. (2022). *Status, threats, and overlap of globally important pangolins and threatened small carnivores in a disturbed wetland mosaic of southern Vietnam*. 10.21203/rs.3.rs-1725170/v1
- Chao, N. et al. (2022). *Strengthening capacity for species conservation in South-east Asia: a provisional assessment of needs and opportunities for the Asian Species Action Partnership*. Oryx, 56(5): 760-763

33 FELID

TAG Chair: Alexander Sliwa (Cologne Zoo, Cologne, Germany) • TAG Vice Chairs: André Stadler (Alpenzoo Innsbruck, Innsbruck, Austria) and David Barclay (Highland Wildlife Park, Kingussie, United Kingdom)

INTRODUCTION

The year 2022 was busy for the EAZA Felid TAG. There were many online – due to remaining COVID-19 restrictions – meetings, which were crucial for collaboration and preparations for the continuation of the TAG's work.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

The TAG held a three-day RCP meeting on 20-22 January and a one-day mid-year meeting on 11 March. Through these there was prioritisation to conduct LTMPs for several species, the one for Sumatran tiger (*Panthera tigris sumatrensis*) was held in July.

No EEP or TAG evaluations took place, however in the RCP process and through internal discussions it was obvious that some programmes needed changes. There was yet another Coordinator to be found for the mainland Clouded leopard EEP.

ACHIEVEMENTS DURING THE YEAR

The mid-year meeting was the base for drafting a special session on "putting cats together" during the EAZA Annual Conference in Portugal. This two-hour session gave an introduction, presentations and video examples on preparing the mixing of new pairs of cats with a focus on tigers (*Panthera tigris*), Asiatic golden cats (*Catopuma temmincki*), and fishing cat (*Prionailurus viverrinus*).

The TAG Chair and Vice Chair attended the joint TAG Chairs meeting in Long Beach (USA) and gave a presentation on the *Collaboration over the decades between the EAZA Felid TAG and the IUCN Cat SG*.

COLLABORATIONS

The Felid TAG continues to collaborate closely with the IUCN Cat SG in exchanging ideas, helping each other in the joint assessment of topics that are of mutual interest. This is done via regular online meetings. The TAG members collaborate closely with each other on internal issues, both within Species Committees and within TAG meetings, offering advice and contacts to external researchers and specialists. There are also collaborations with many external researchers on specific topics and with well-known laboratories, such as the Senckenberg Institute (Germany).

TAG members on a visit to the Iberian Lynx Training and Recovery Complex (CTRLI) in Silves, Portugal on 28.9.22 © A.Sliwa

CONSERVATION AND RESEARCH

Felid TAG members are involved in a wide range of conservation and research activities.

This starts from baseline research to look into species ecology, behaviour and genetics in the wild. For example, TAG Chair Alex Sliwa (Cologne Zoo, Germany) has been studying for three decades the black-footed cat (*Felis nigripes*).

Several TAG members and Coordinators are instrumental in furthering research into the genetic structure of EAZA cat populations including the Eurasian lynx (*Lynx lynx*), or testing for subspecific purity of Carpathian lynx (*L. l. carpathicus*) and lions (*Panthera leo leo* and *P. l. melanochaita*).

Also, genetic testing of European wildcats (*Felis silvestris*) for hybridisation with domestic cats as part of the Monitoring Programme kept by Attica Zoological Park (Greece) with the Saving Wildcats Project on Scottish Wildcats (Royal Zoological Society of Scotland, UK - https://savingwildcats.org.uk) who performed the analysis. This is instrumental in forming the base of reintroduction programmes, which make use of EAZA felid populations in future.

In August, the TAG Chair took part in a meeting of the Advisors to the Saving Wildcats Project on Scottish Wildcats to discuss the wildcat breeding, keeping and reintroduction strategies at the Highland Wildlife Park (UK).

There is ongoing collaboration with research institutes, such as the GEOlifes Reproductive Services (Germany) led by Imke Wiemann (former I. Lüders) and the Leibniz Institute for Zoo and Wildlife Research (IZW, Germany) to further reproductive examinations of Asiatic lions (*P. l. persica (leo)*) and Persian leopards (*Panthera pardus saxicolor / tulliana*) as part of the Felid Gamete Rescue Project by IZW through Jennifer Ringleb.

In March the Persian leopard EEP Coordinator, José Dias Ferreira (Lisbon Zoo, Portugal), and the TAG Chair took part in a range-wide status assessment for the leopard subspecies by the IUCN Cat SG and CMS.

Several TAG members and Chairs took part in a visit to the Iberian Lynx Training and Recovery Complex (Portugal) in September.

ADDITIONAL COMMENTS

The TAG members were involved in the following publications:

- Breton, G. et al. (2022). *Body weights and measurements of African sand cats (Felis margarita margarita).* Mammal Research 67(3):279-285
- Ferreira, J.D. and Sliwa, A. (2022). *Ex situ conservation of the Persian leopard - the EAZA leopard EEP*. CATnews, Special Issue 15: 72-75
- Meißner, R. et al. (2022). *The potential and shortcomings of mitochondrial DNA analysis for cheetah conservation management*. Conservation Genetics, 24: 125-136
- Sliwa, A. et al. (2022). *Causes of mortality in a population of black-footed cats in central South Africa*. African Journal of Ecology, 60(1): 1-7

34 MARINE MAMMAL

TAG Chair: Claudia Gili (Genoa Aquarium, Genoa, Italy) • Vice Chair: Agustín López Goya (Madrid Zoo Aquarium, Madrid, Spain)

INTRODUCTION

During 2022, the EAZA Marine Mammal TAG oversaw EEPs for the Bottlenose dolphin (*Tursiops truncatus*), Caribbean manatee (*Trichechus manatus*), Patagonian (*Otaria flavescens*), Californian sea lion (*Zalophus californianus*), South American fur seal (*Arctocephalus australis*) and an ESB for the Grey seal (*Halichoerus grypus*).

Our Veterinary Advisors are:

- Daniel García Párraga (Valencia Aquarium, Spain): TAG Advisor
- Kathrin Baumgartner (Nuremberg Zoo, Germany) and Antonio Mignucci (Puerto Rico University, USA): Caribbean manatee international Vet Advisors
- Nicola Pussini (Genoa Aquarium, Italy) and Kerstin Terner (Duisburg Zoo, Germany) as Pinniped Advisors
- Tania Monreal (International Zoo Veterinary Group, IZVG - Independent Veterinarian) is a member of our TAG as a representative between EAZA and the Accreditation Committee of European Association for Aquatic Mammals (EAAM).
- Adriane Prahl (Hagenbeck Zoo, Germany) for the walrus (*Odobenus rosmarus*)

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

The TAG continued working on all the programmes and addressing the major challenges for the species, targeted by either our detractors or by commercial requests from other countries.

The population of bottlenose dolphins is slowly decreasing (as planned) to face the space problem. Breeding is not completely interrupted but has been reduced by about 80%. The EEP is helping holders to manage their population according to the space available. At the same time, a lot of effort is given to the search for new holders. The new BPG are under development and will be ready by September 2023.

ACHIEVEMENTS DURING THE YEAR

The new style EAZA Marine Mammal RCP was officially approved by the EEP Committee in July 2022.

In this document a total of 33 species were the subject of discussions. Eight EEPs were proposed and will be established as new style EEPs and managed to fulfill different roles. Two new programmes will be established for Harbour seals (*Phoca vitulina*) and Lahille bottlenose dolphin (*Tursiops truncatus gephyreus).* Furthermore, a combined Fur seal EEP for South American fur seal (*Arctocephalus australis*) and South African fur seal (*A. pusillus*) will be established. The Walrus ESB has been discontinued. All other existing programmes will be re-established as new style programmes to fulfill their specific roles.

Thanks to a close collaboration of the TAG with *Ex Situ* Options for Cetacean Conservation (ESOCC), there is a possibility of getting involved with conservation projects on freshwater dolphins.

COLLABORATIONS

Collaboration with the EAAM continued, aiming to achieve the best possible species management and care of marine mammals, and to make the greatest possible contribution to public education and conservation of these species and their habitats. A Memorandum of Understanding between EAZA and EAAM was approved by the EAZA Council in September.

Harbour seal (*Phoca vitulina*) © Craig Allum, Selwo Marina

CONSERVATION AND RESEARCH

The conservation and research activities continued for the Rescue and Information Network Project, with EAAM support: rehabilitation, monitoring of Mediterranean monk seal (*Monachus monachus*) populations and participation in national and international fora.

TAG members were involved in the following publications:

- Komnenou, A.T. et al. (2022). *First Report of Uncinaria hamiltoni in Orphan Eastern Mediterranean Monk Seal Pups in Greece and Its Clinical Significance*. Pathogens, 10(12):1581
- Koemtzopoulos, K. et al. (2022). *Molt Chronology of a Male Mediterranean Monk Seal (Monachus monachus) from the Eastern Mediterranean Sea*. Aquatic Mammals, 48(1): 15-20

35 ELEPHANT

TAG Chair: Thomas Kölpin (Wilhelma Zoo, Stuttgart, Germany) • Vice Chairs: Jana Pluháčková (Ostrava Zoo, Ostrava, Czechia) and Cordula Galeffi (Zürich Zoo, Zürich, Switzerland)

INTRODUCTION

The EAZA Elephant TAG manages two EEPs: for the African elephant (*Loxodonta africana*) and the Asian elephant (*Elephas maximus*). The goal of the TAG is to develop demographically and genetically self-sustainable populations of both species within EAZA institutions.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

In 2022 the African elephant EEP had 2.3 births, 4.4 deaths and transferred 3.1 elephants. At the end of 2022, 57.136 (193) African elephants in 46 institutions are coordinated as part of the EEP.

In 2022 the Asian elephant EEP had 3.2 births, 5.5 deaths, 0.4 exits from the EEP, and 9.0 transfers. The EEP ended the year with 100.207 (307) Asian elephants among 75 institutions.

ACHIEVEMENTS DURING THE YEAR

Three TAG meetings took place during the year: a closed mid-year meeting in May in Heidelberg Zoo (Germany), as well as one closed and one open meetings at the EAZA Annual Conference.

The Veterinary Advisors launched Elephant Endotheliotropic Herpes Virus (EEHV)-antibody monitoring recommendations, which are available on the Elephant TAG page on the Member Area.

Achievements for the African elephant EEP coordinated by Arne Lawrenz (Wuppertal Zoo, Germany):

- online meetings with many facilities to discuss further steps with the aim to structure the population into three main groups: breeding, bachelors, old female homes
- African elephant LTMP finished and published
- a paper on survivorship and longevity was published
- improved breeding due to transfer of bulls and reestablishment of some matrilines
- ongoing liaison with SSP and the initiative to join up with the IUCN African Elephant SG (AfESG)

Asian elephant (*Elephas maximus*) herd at Dublin Zoo © Thomas Kölpin

Achievements for the Asian elephant EEP coordinated by Harald Schmidt and Jeroen Kappelhof (both Rotterdam Zoo, the Netherlands):

- many online and in-person meetings with EEP participants, which helped determining the long-term strategy and to increase the understanding of our plans
- Asian elephant LTMP finished and published
- new bachelor male groups at Łodz Zoo (Poland), Les Terres de Nataé and Touroparc (both France)
- transfer of 0.2 from Rotterdam Zoo to the Smithsonian National Zoo (USA): the start of a long-term collaboration between the EEP and SSP

COLLABORATIONS

Online meetings took place for a closer collaboration and exchange of data and experience with the American African elephant SSP Coordinators. In addition, there was an update on the existing conservation efforts of African elephant holders with the attempt to pool and strengthen the efforts in harmony with the IUCN.

The Asian elephant EEP had online meetings with the SSP Studbook keeper to share data and experiences. Other meetings took place with different field experts, for example members of the IUCN SSC Asian elephant SG but also researchers working in India.

The EEP is working with Wageningen University and Research (the Netherlands) to carry out large scale genomic research.

CONSERVATION AND RESEARCH

EEP participants in both programmes are participating in many research projects and are supporting a multitude of conservation projects. Detailed information can be found in the EAZA Conservation Database.

The Asian elephant EEP is currently working on large-scale genomic research into the genetic health of Asian elephant populations in the wild and in European zoos. Topics like subspecies, population history and genetic diversity are part of the project.

Elephant TAG Vet Advisors subgroup
Student research activities included a DVM's project by postgraduate student Anne Hess (University of Veterinary Medicine Budapest, Hungary) on *Lesions found in the post-mortem reports of the Asian and African elephants of EAZA* which was finished in 2022; and a continuing project by Chanett Nordli (University of Veterinary Medicine Budapest) on *Establishing individual hematological normal values at the Budapest Zoo for young elephants - in their EEHV-HD "susceptible" period*.

Other research projects focus on EEHV.

Javier Lopez (Chester Zoo, UK) reported that the University of Surrey (UK) had inoculated three adult Asian elephants with two different EEHV-antigens (E40 and U47), each of them vectored by Modified Vaccinia Ankara (MVA) and as subunit antigen plus an adjuvant. Results have yet not been communicated.

A team at Utrecht University (the Netherlands) also made significant progress with recently developed antibody-ELISA used in two Sri Lankan elephant orphanages. The results indicated that elephants in large herds are more frequently exposed to EEHV, which results in protective acquired immunity in all the animals regardless of their age. In contrast, elephants in (small) zoo herds fail to maintain sufficient EEHV-shedding, impeding the development of acquired immunity in young elephants when they have lost protective immunity from maternal antibodies. This condition stresses the need for young elephants to become naturally infected during the time frame characterised by the moment that the protecting maternal antibodies are still present in sufficient numbers, and their decrease until protective levels around 12-15 months.

The development of new sets of antibodies have made it possible to distinguish EEHV-antibodies of the different EEHV-species from each other, making it possible to evaluate the antibody-status of each calf. This knowledge makes it possible to determine the vulnerability for EEHV-HD in young elephants. With that knowledge, calves at risk can be monitored closely and it gives a warning to start emergency treatment early in the course of the disease.

Elephant TAG Research Advisor subgroup
The Research Advisory subgroup reviewed six research proposals and approved the following four:

- *Asian elephant genomics for conservation: from human care to the wild* by Jeroen Kappelhof
- *The difference in vitamin D3 synthesis in skins of African and Asian elephants from western European zoos* by Rens Lindeboom (Utrecht University)
- *Can deep learning facilitate nighttime monitoring in zoo elephants* by Paul Wilhelm Dierkes (Goethe University Frankfurt, Germany)
- *Investigation of the influence of social structure on social learning in elephant and the human-elephant relationship* by Annaëlle Surreault-Chable (Zoo Le PAL, France)

The subgroup also developed a TAG information form to collect information on research projects with no need for TAG approval. This resulted in the following compilation of ongoing projects:

- *Morpho-functional studies of the Asian elephant trunk* by Raphaël Cornette (ISYEB, National Museum of Natural History, France)
- *Emotional communication between African elephants in positive (play), negative (aggressions) and neutral contexts* by Ivan Norscia (Turin University, Italy)
- *Fecal particle size in relation to molar status in four female Asian elephants* by Christian Schiffmann (University of Zürich, Switzerland)

36 EQUID

TAG Chair: Ulrike Rademacher (Wilhelma Zoo, Stuttgart, Germany) • Vice Chairs: Jaroslav Šimek (Prague Zoo, Prague, Czechia) and Tanya Langenhorst (Marwell Wildlife, Winchester, United Kingdom)

INTRODUCTION

A total of 12 species falls under the remit of the EAZA Equid TAG of which eight are formally managed: African wild ass (*Equus africanus somaliensis)*, Grevy's zebra (*Equus grevyi*), Turkmenian kulan (*Equus hemionus kulan)*, onager (*Equus hemionus onager)*, kiang (*Equus kiang*), Przewalski's horse (*Equus przewalskii*), maneless zebra (*Equus quagga borensis*), Hartmann's mountain zebra (*Equus zebra hartmannae)*.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

The Equid TAG evaluation was carried out in 2022 and we are awaiting feedback and results.

Paweł Sroka (Wrocław Zoo, Poland) was appointed as the new Coordinator for the Turkmenian kulan EEP in November 2022 after longstanding Coordinator Anna Mękarska (now EEO, the Netherlands) resigned to take on a new role. Paweł was also approved by WAZA as the international Studbook keeper for kulan.

One stallion was prevented from leaving the EEP management and will be transferred to an EEP institution.

A new Species Committee for the Grevy's zebra EEP was elected for the period 2022-2027.

The EEP population is at its lowest in many years with no animals available. Recommendations to increase breeding were issued to counteract this.

The Kiang EEP population in European zoos is decreasing due to low interest from zoos in this species. Breeding recommendations will be made to halt this trend.

A workshop for the development of a LTMP for the Przewalski's horse EEP was held in October in Hortobágy

National Park (Hungary).

The Maneless zebra EEP does not have enough adult males and therefore sees a severe lack of breeding.

The Hartmann's mountain zebra EEP gained several new holders in 2022 and now has 28 participants.

COLLABORATIONS

The Przewalski's horse EEP collaborates with the International Takhi Group for conservation work, with the Leibniz Institute for Zoo and Wildlife Research (IZW, Germany) as part of the semi-reserve Advisory Group, and with the Association for the Conservation of Biodiversity of Kazakhstan regarding reintroduction of Przewalski's horses in Kazakhstan. The EEP is also currently investigating options of collaboration with grazing or rewilding initiatives.

Other collaborations for conservation and research are described below.

CONSERVATION AND RESEARCH

Research on factors underlying infertility in Przewalski's horses continued with the cooperation of Munich Zoo, Technical University Munich and Ludwig-Maximilian-University Munich (all Germany).

In Eastern Mongolia, the fourth reintroduction site for Przewalski's horses is being selected in cooperation with Prague Zoo (Czechia), National University of Mongolia, Mongolian Mammalogical Society, and Mongolian University of Life Sciences.

An investigation on possibilities to reintroduce the species to Kazakhstan is ongoing.

Under the African wild ass EEP, Wouter Pieters (University of Edinburgh, UK) is conducting a research study to evaluate the potential for reintroduction of insurance populations – under human care – of two non-domestic ungulate species from the horn of Africa. Through review of post-mortem reports and analysis of data on diseases obtained via a veterinary health survey, he intends to review the mortality and morbidity in the EEP populations of lesser kudu (*Tragelaphus imberbis*) and Somali wild ass.

Redae Teclai Tesfai (Colorado State University, USA) and Redwan Mohammed Yimer (Samara University, Ethiopia) also completed Maxent analyses of optimum and suitable habitat for the African wild ass in Eritrea and Ethiopia.

Kenya has been suffering a terrible drought since 2020. The country has by now missed five rainy seasons and the situation is dire for wildlife and people. Marwell Wildlife (UK) and their partners, the Grevy's Zebra Trust (Kenya), have been providing hay to the wild populations since June 2021, supporting nearly 700 Grevy's zebras. As costs were spiralling out of control, the EEP Coordinator (with support from the TAG) sent a call in November 2022 to all Grevy's zebra EEP holders to provide emergency funding. The European zoos responded swiftly and generously with over € 94,000 collected in a short space of time. This has secured the efforts for many more months and will hopefully prevent an irrecoverable loss of the core population.

Emergency hay feeding of Grevy's zebras (*Equus grevyi*) in Kenya © Andrew Letura, Grevy's Zebra Trust

Marwell scouts are also working closely with the Kenya Wildlife Service (KWS) and local partners to combat poaching of Grevy's zebras and other wildlife as this has drastically increased during the drought.

The study "*Genetic evaluation of the EEPs for wild Asiatic wild asses as a basis for future in situ and ex situ conservation strategies*" by Petra Kaczensky and Ralph Kuehn (Inland Norway University of Applied Sciences, Norway) has been completed in 2022 after sampling almost all EEP animals. The results show the two *Equus hemionus* EEP populations in human care (onager and kulan) are clearly distinct from each other and cluster with the wild populations from which the respective founders of the two EEPs were believed to have originated. The authors recommend continuing to manage the two EEPs separately.

The Hartmann's mountain zebra EEP is in contact with Morris Gosling (University of Newcastle, UK) who is working on *in situ* research and conservation for this species. The EEP is looking to get more involved.

ADDITIONAL COMMENTS

Bernátková, A. et al. published *Influence of weather on the behaviour of reintroduced Przewalski's horses in the Great Gobi B Strictly Protected Area (Mongolia): implications for conservation* in BMC Zoology in 2022 (7(1), 1-17).

37 RHINOCEROS

TAG Chair: Lars Versteege (Beekse Bergen, Hilvarenbeek, the Netherlands) • Vice Chair: Katharina Herrmann (Berlin Zoo, Berlin, Germany)

INTRODUCTION

The vision and mission of the EAZA Rhinoceros TAG is to have a healthy, viable population of free ranging and intensively managed rhinos ranging through intact ecosystems, where they are valued and cherished both locally and globally, and to ensure all populations in human care are healthy, self-sustaining and genetically viable and are capable of being an effective tool in support of rhino conservation in the wild. 2022 could be summarised as a transition year. In the beginning of the year, many institutions were still suffering from COVID-19 measures, slowly easing up during the year.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

The status of the three EEPs within the Rhinoceros TAG are as follows.

White rhinoceros (*Ceratotherium simum*)

It was another very good year for the white rhino population! Despite the difficulties caused by COVID-19 and Brexit, the EEP population developed strongly with 13 (7.6) births (2.0 DNS). Twelve animals (5.7) were exchanged between the EEP participants, and seven (4.3) animals died. The population has grown to 360 animals forcing the EEP to become extremely creative. All participants are asked to create separation exhibits for animals that will potentially need to be outplaced, and the EEP is pro-actively searching for additional holders. The balance between breeding (for health and behaviour as well as demographic reasons) and maximum capacity is tricky. Contraception is not easy, and one risks losing breeding animals for life.

Black rhinoceros (*Diceros bicornis michaeli*)

2022 was a challenging year for the Black rhinoceros EEP population. Young black rhinos usually need to be moved out of their place of birth once they become independent from their mothers at around three years old. As the number of births each year exceeds the number of deaths, additional space is required either with the current holders or by finding new holders. As for white rhinos, contraception of black rhinos is too risky to the long-term breeding health of this extremely important zoo population. Due to the financial and practical challenges on zoos caused by COVID-19, a number of building projects for new rhino facilities were delayed. The planned transfer from the EEP to the Grumeti Game Reserve in Tanzania was also delayed in 2022 adding to the issue. This caused a number of difficult situations for zoos that couldn't move animals as planned. It is hoped that these new facilities will be completed in 2023 and the translocation to Grumeti can take place, freeing up crucial space for the development of the EEP population. During 2022 there were three births (1.2) and three deaths (1.2). Four animals were transferred (4.0). Overall, the population numbers remained unchanged with an end of year population of 90 (40.50).

White rhinoceros (*Ceratotherium simum*) calf © Colchester Zoo

Indian rhino (*Rhinoceros unicornis*)
In 2022, the exhibit plans of Zoo Guadalajara (Mexico) and Zoosafari Fasano (Italy) were approved. Guadalajara Zoo was approved as a non-EAZA EEP participant by the EEP Committee in early 2022.

In February 2022, the breeding stop – imposed in 2019 due to the increasing difficulty to find new holders for this species – could partly be lifted and detailed breeding recommendations were sent to all holders.

This year, 5.1 animals were born and 4.1 survived. This skew in the sex ratio and the increasing numbers of male calves are a serious problem in this EEP and solutions will need to be found to house single bulls or bull groups.

As far as genetics is concerned, it is important to continue increasing the representation of underrepresented blood lines. Three potential founders have still not bred successfully and are unlikely to do so in future. The same applies to the old females at Singapore Zoo (Singapore). Closer cooperation and intensified exchange of animals between the EEP and SSP is important to improve the founder base.

All holders with a non-breeding recommendation are requested to follow the breeding stop.

In November, the first online meeting for the development of an LTMP was held.

ACHIEVEMENTS DURING THE YEAR

Despite all the difficulties, the Rhinoceros TAG pushed through with plans progressing towards a One Plan Approach in collaboration with every established rhino organisation worldwide. Colleagues from all over the world joined the brainstorm session giving a lot of important feedback allowing to plan for a joint way moving forward. The feedback was collected in a draft action plan for further discussion. During the joint TAG Chairs meeting in the USA the draft action plan was discussed with the AZA Rhino TAG and preparations for individual actions were prepared.

During the EAZA Annual Conference in Albufeira (Portugal), a full TAG meeting was organised with Save the Rhino International and a speaker from South Africa joined online. Once again, this showed the dedication of the TAG towards global conservation cooperation! The update presentation from Save the Rhino International on the impacts of the ongoing poaching crisis on rhinoceros populations, affecting the daily work of many rhino conservation partners on the ground, underlined the importance of holders supporting rhino conservation. Bi-monthly conservation updates can be found on the EAZA Rhinoceros TAG workspace on the Member Area.

COLLABORATIONS

In addition to the cooperation with Save the Rhino International and the International Rhino Foundation, all three EEPs have strong ties with rhinoceros conservation partners all over the world. The TAG is pushing hard to increase global cooperation. Having only five species within its remit, of which three are represented *ex situ,* makes it orderly but also complicated, as all conservation focus lies on only a few programmes. The EAZA rhinoceros *ex situ* community is represented in the IUCN SSC African Rhino SG through the TAG Chair. Input was provided on various occasions throughout the year.

Indian rhinoceroses (*Rhinoceros unicornis*) © Basel Zoo

CONSERVATION AND RESEARCH

The TAG is still working on the possible translocation of three female black rhinoceroses from Port Lympne Wild Animal Park (UK), originally planned for 2022, which is a genetic supplementation of the Grumeti population in South Africa funded and organised by the Aspinall Foundation (UK).

38 TAPIR AND SUIFORM

TAG Chair: Jörg Beckmann (Nuremberg Zoo, Nuremberg, Germany) • Vice Chair: Jan Pluháček (Ostrava Zoo, Ostrava, Czechia)

INTRODUCTION

The EAZA Tapir and Suiform TAG is responsible for the tapirs (Tapiridae), hippopotamuses (Hippopotamidae), pigs (Suidae), and peccaries (Tayassuidae).

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

The new EEP Coordinators for the Chacoan peccary (*Catagonus wagneri*) and Malayan tapir (*Tapirus indicus*) started working intensively on their programmes, which is highly appreciated by the TAG!

Six (out of nine) EEPs were approved as new style EEPs, namely for the Lowland tapir (*Tapirus terrestris*), Malayan tapir, Common hippo (*Hippopotamus amphibius*), Pygmy hippo (*Choeropsis liberiensis*), Visayan warty hog (*Sus cebifrons*), and Chacoan peccary.

The LTMP for lowland tapir was compiled and published. Species Committees were elected or re-elected for the Common hippo EEP, Malayan tapir EEP, and Lowland tapir EEP.

A new style EEP was created and a new Species Committee was appointed for the common hippo (*Hippopotamus amphibius*) in 2022 © Jan Pluháček

ACHIEVEMENTS DURING THE YEAR

After several changes in the coordination of the EEPs and two years of limitation due to the COVID-19 pandemic, the TAG held its first mid-year meeting in Wrocław Zoo (Poland) from 22 to 24 June 2022. A TAG session was also held at the EAZA Annual Conference in Portugal. The TAG actively participated in the joint TAG Chairs meeting in Long Beach (USA) in April 2022. Based on discussion at this meeting, the TAG started several new projects including a slight revision of the RCP. In addition, Veterinary Advisors were established for pigs and peccaries.

COLLABORATIONS

The Tapir and Suiform TAG collaborates with all relevant IUCN SSC SG: the Hippo SG, Tapir SG, Peccary SG and Wild Pig SG, with at least one TAG member also in each of these SGs. The TAG Vice Chair is co-Chair of the IUCN SSC Hippo SG.

The TAG also collaborates with several universities and regional zoo associations, especially with AZA.

CONSERVATION AND RESEARCH

TAG members are actively involved in *in situ* conservation. A special case is the official partnership between Ostrava Zoo (Czechia) and the Hippo SG. The zoo supports and supervises the creation and updating of new webpages of this SG. Another outstanding activity includes *in situ* employees of Copenhagen Zoo (Denmark) being involved in Malayan tapir conservation.

African Swine Fever (ASF) is still one of the biggest threats for wild pigs, both *in situ* and *ex situ,* threatening species of endangered wild pigs in Asia as well as our populations in EAZA zoos. This disease has the potential to eradicate whole populations and species. Therefore, the TAG continued working with several experts, especially from the IUCN SSC Wild Pig SG, European Association of Zoo and Wildlife Veterinarians (EAZWV), German Association of Zoo Veterinarians (VZT), Wildlife Conservation Society (WCS), the Friedrich Loeffler Institute (FLI, Germany) and the Association of German-speaking Zoological Gardens (VdZ) on a better understanding of the disease with the aim to develop an ASF vaccine, to save species from extinction, all in the spirit of the One Plan Approach.

ADDITIONAL COMMENTS

The TAG was involved in two poster presentations at the 13th International Symposium on Wild Boar and other Suids in Seva, Barcelona 2022: "*Stick on the pig: an alternative non-invasive method for fixing telemetry device on wild boar (Sus scrofa)*" and "*Pick your pig! Joint forces in pig and peccary conservation: the new Regional Collection Plan as One Plan Approach*" (see book of abstracts at https://wildboarsymposium.com).

One article was published in Suiform Soundings, the IUCN newsletter of the IUCN SSC SGs for Wild Pigs, Peccaries and Hippos: "*One Plan Approach to save species— a new integrative Regional Collection Plan for hippos, pigs, peccaries, and tapirs*" (Suiform Soundings 20(2), 2022).

39 CATTLE AND CAMELID

TAG Chair: James Burton (Chester Zoo, Chester, United Kingdom) • Vice Chair: Marcel Alaze (Münster Zoo, Münster, Germany)

INTRODUCTION

The EAZA Cattle and Camelid TAG is implementing a number of activities agreed in a two-year plan that started in early 2021. These include expanding the group with new expertise, increasing the species' profiles with EAZA Members, and continuing to develop conservation and research partnerships.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

The TAG Chair and Vice Chair had a constructive call with members of the EEP Committee and have taken forward many of the recommendations provided in the evaluation at the end of the previous year.

Amy Humphreys (Chester Zoo, UK) was appointed as the Coordinator for the Banteng EEP, after a couple of years in an interim role.

The Gaur EEP transitioned to a TAG MON-T species, with Aude Bourgeois (Ménagerie du Jardin des Plantes, France) carefully managing the process and encouraging holders to follow it. It has been a challenging transition because of differing views. We very much appreciate her patience in this recent matter and hard work to manage and encourage holders of gaur in the previous years. The Chair and Vice Chair will hold a call with all holders in 2023.

As it has been the case for some years, the European bison EEP continues to expand slowly with former holders wishing to hold the species again and from collections on the periphery of EAZA. The fact that there are active reintroduction options is almost definitely a factor in the continued and growing interest in participating in the programme.

ACHIEVEMENTS DURING THE YEAR

The TAG has a new Education Advisor, Charlie Daly (Chester Zoo) and Communications Advisor, Anna Jemmett (ZSL, UK). A questionnaire will be circulated to holders in early 2023 to understand their interests for support in education and communication from the TAG. The process of recruiting a new Vet Advisor has started and will be completed in early 2023.

A Tamaraw EEP was established, with Fiona Sach (ZSL London Zoo, UK) as Coordinator. This EEP will work to raise funds for *in situ* activities and provide technical support to a feasibility study for breeding in human care and translocation.

The TAG has nearly completed an interim review of the RCP, which will be finished in the first months of 2023.

The BPG for banteng (*Bos javanicus*) were completed in 2022 and will be published in 2023. We also aim to draft the BPG for anoa (*Bubalus spp.*) in 2023, and we are discussing the adaptation of a version of European bison husbandry guidelines into the EAZA BPG format.

COLLABORATIONS

During the TAG meeting at the EAZA Annual Conference, there were updates from representatives of conservation partners working on wild camel (*Camelus ferus*), saola (*Pseudoryx nghetinhensis*), anoa and banteng. We were also able to give updates from the Wild Cattle Vice Chair of the AZA Ungulate TAG and on the tamaraw (*Bubalus mindorensis*). We hope this will encourage further collaboration in future years.

The fourth international awareness raising day for the Anoa and Banteng GSMP involved 37 institutions. This 'Action Indonesia Day' involved a range of virtual and face to face visitor events and activities. In 2022, TAG members were involved in defining plans for Action Indonesia (anoa and banteng GSMPs) for 2023-2025.

The Coordinator for the European bison EEP continued to participate in the wider planning activities for the species as a member of the IUCN/SSC Bison SG. This international group, which also operates with the active assistance of the IUCN/SSC Conservation Planning SG, had representation from all the bison range states, but as with many collaborative activities, the invasion of Ukraine has changed the composition of that group and caused it to narrow its geographical focus, which we hope is a temporary situation.

CONSERVATION AND RESEARCH

Genetic analysis of the Indonesian anoa, banteng and babirusa (*Babyrousa babyrussa*) zoo populations were initiated by the Indonesian Zoo and Aquarium Association (PKBSI) in collaboration with genetic experts from Copenhagen Zoo (Denmark) and Ludwig Maximilian University Munich (Germany). EAZA Members generously contributed funding for sample collection.

The second year of population monitoring of banteng in Alas Purwo National Park (Indonesia) was completed, giving data that will build into a time series. This was supported financially by multiple EAZA Members.

During November 2022, the latest group of 1.9 European bison that had been gathered at Berlin Tierpark (Germany) was sent to Azerbaijan to augment the previous shipments of animals that have been supplied by the European bison EEP, in partnership with WWF Germany, to establish a new wild population in Shahdag National Park. Unfortunately, the planned support from the EEP for establishing a herd in the Chernobyl Exclusion Zone (Ukraine) and augmenting the small, reintroduced population of bison in the Russian South Caucasus, in partnership with WWF Germany, had to be suspended due to the conflict in Ukraine.

Camera trap photo of a banteng (*Bos javanicus*) for population monitoring in Alas Purwo National Park, Indonesia © Alas Purwo National Park

Wild camel research is ongoing, with a PhD (Wild Camel Protection Foundation, University of Kent and ZSL Institute of Zoology; all UK) to be completed in July 2023. This will include a Mongolian population estimate and genetic study on the populations in the wild and in human care. Initial results suggest that there is introgression of Bactrian genes widely across the Mongolian population, but at low levels. Results are also suggesting that the herd in human care captures similar levels of diversity and inbreeding as seen in the wild. The analysis is still ongoing.

The herd in human care in Mongolia (34 individuals) was ear tagged by Knowsley Safari Park in April 2022, allowing for individual identification, genetic analysis and improved Studbook management done by Prague Zoo (Czechia). A second site is being built in Mongolia to be able to split the population in human care for improved management. This is due to be completed in Autumn 2023.

ADDITIONAL COMMENTS

The following article published in 2022 involved members of the TAG: Jemmett, A. M. et al. (2022). *What's in a name? Common name misuse potentially confounds the conservation of the wild camel Camelus ferus.* Oryx, 57(2): 175-179

The Action Indonesia (GSMP for banteng and anoa) annual report for 2022 is available on www.asianwildcattle.org/resources.html.

40 DEER

TAG Chair: Noam Werner (Jerusalem Zoo, Jerusalem, Israel) • TAG Vice Chair: Marco Penello (La Torbiera Zoo, Agrate Conturbia, Italy)

INTRODUCTION

The EAZA Deer TAG is responsible for three taxonomically distinct groups: the chevrotains (mouse-deer; *Tragulidae*), musk deer (*Moschidae*) and true deer (*Cervidae*). Following the taxonomy currently used by the IUCN/SSC Red List, a total of 73 species falls under the remit of the Deer TAG (10 Tragulidae; 7 Moschidae; 56 Cervidae).

In 2022 the Deer TAG held a meeting during the EAZA Annual Conference. The TAG Chair also attended the International Deer Biology Congress, which took place in September 2022 in Osijek (Croatia).

The TAG officially appointed Marco Penello, from La Torbiera Zoo (Italy), as its new Vice Chair as well as William Magnone, from Parco Natura Viva (Italy), as its Veterinary Advisor.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENT

During 2022 the TAG added two more programmes that were recommended by its RCP: the Sambar EEP, which is coordinated by Port Lympne Safari Park (UK) and the Large-antlered muntjac EEP, which is coordinated by the Leibniz Institute for Zoo and Wildlife Research (IZW, Germany). The latter is a unique programme as no animals are held in human care and the main tasks of the Coordinator will be to raise support for *in situ* conservation work and help build professional knowledge for when animals will be brought into breeding facilities as recommended by the IUCN SSC Deer SG. The White-lipped deer EEP also saw a change in leadership. It is now coordinated by Mulhouse Zoo (France).

Hog deer (*Axis porcinus*), Zoo La Torbiera © Noam Werner

In 2022, the TAG's work was evaluated by the EEO, as part of the second round of TAG evaluations. The overall grade was determined as good. One of the comments focused on the need to create LTMPs for the various programmes. During the last few months, several EEPs completed the process and their respective LTMPs were published.

Import of hoofstock, including deer, musk-deer, and chevrotains, from third countries, including the UK, into the EU, is still a major obstacle for managing the TAG's programmes. Despite the new EU Animal Health Law going into force in mid 2021, it is too early to judge whether the slight ease of restrictions would truly make an impact on the transfer of hoofstock into the EU.

Another EU act, the EU Invasive Alien Species Regulation (1143/2014), is also challenging. One species, the Reeves' muntjac (*Muntiacus reevesi*), has been included in the EU list, which means that its population in human care should be phased out. However, because the species is listed as Vulnerable by conservation authorities in its native China, which resulted in the establishment of a new EEP for this species, the TAG offers support to institutions wishing to apply for an exemption from the Regulation. Axis deer (*Axis axis*) was also added to the EU list, and while this species is listed as Least Concern, the rationale behind its inclusion might set a precedent for the inclusions of more species, such as the sika deer (*Cervus nippon*). The latter is also listed as Least Concern at species level, but some subspecies are threatened, and EAZA runs an EEP for the Extinct in the Wild Indochinese sika

deer (*C. n. Pseudaxis*). This species has already been added by some EU Member States to their respective national lists, which means that zoos in these countries officially need to phase out the species, including the Indochinese sika deer (*C. n. Pseudaxis*). Other species, such as water deer (*Hydropotes inermis*) and even European fallow deer (*Dama dama*), have also been added to various national lists. While these species are not managed at the moment, the water deer is threatened in the wild (Vulnerable) and the fallow deer might also be categorised as such soon. The TAG is monitoring such national-level decisions and provides assistance as necessary.

Another potentially emerging challenge is the identification of Chronic Wasting Disease (CWD) in Europe. In North America, CWD is prevalent and restricts the transfer of cervids to the point that some AZA programmes are dying out and some unmanaged species are also being phased out. In Europe CWD has been reported in very few animals, all wild or semi-domesticated, and only in Scandinavia. The EU recently adopted new rules (Commission Regulation 2022/2246) to minimise the risk of the disease spreading, and while this regulation could be strict, exemptions regarding transfers between zoos have already been included. These exemptions will hopefully limit the effects of these measures on the management of Deer TAG EEPs.

COLLABORATIONS

Cooperation with the IUCN/SSC Deer Specialist Group (DSG) is on-going. the TAG Chair is also serving as a Co-Chair of the DSG and several TAG members are also members of the DSG. The TAG has on-going collaborations with many researchers regarding several subjects, from taxonomy, biology, physiology to reintroduction. Several TAG members, through the respective programmes they run or through their institutions, have also been involved in long term *in situ* deer conservation projects in range countries, such as the Visayan spotted deer (*Rusa alfredi*) in the Philippines, forest reindeer (*Rangifer tarandus fennicus*) in Finland, and Mesopotamian fallow-deer (*Dama mesopotamica*) in Israel, among others.

41 ANTELOPE AND GIRAFFID

TAG Chair: Sander Hofman (Antwerp Zoo and Planckendael Zoo, Antwerp, Belgium) • Vice Chair: Kim Skalborg Simonsen (Givskud Zoo, Givskud, Denmark)

INTRODUCTION

The EAZA Antelope and Giraffid TAG (AGTAG) is a large and complex TAG, representing approximately 45 species (and about 80 taxa) held in EAZA zoos. After the RCP process in 2022, the number of EEPs in the TAG stands at 26, of which nine are part of an international Studbook. The remaining species within the EAZA region are all monitored by the TAG.

In 2022 the AGTAG formulated a new mission statement: *The EAZA Antelope and Giraffid TAG aims to work towards the conservation of antelopes and giraffids and instil wonder for these species in people.*

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

Following the publication of the RCP in August, the big focus has been to get all the new style EEPs approved and evolve from 12 EEPs and 11 ESBs to 26 new style EEPs. At the end of 2022, 12 of these were either approved or with the EEP Committee for approval. The work continues to get them all formalised by early 2023.

All the TAG EEPs were replaced by new style EEPs. All ESBs were upgraded to new style EEPs except the ones for Springbok (*Antidorcas marsupialis*) and Thomson's gazelle (*Gazella thomsonii*). These species do not have sustainable populations in the EAZA region, face husbandry challenges and are categorised 'Least Concern' according to the IUCN Red List. Therefore, the TAG decided to prioritise other species. There were a few new programmes that qualified for different reasons.

There is now an EEP for Black wildebeest (*Connochaetes gnou*) as the genes we have in EAZA zoos might be purer than the ones in South Africa. This means that there is more potential for this species in the future and population management is important.

Impala (*Aepyceros melampus*) also became an EEP. Like springbok and Thomson's gazelle they are a good exhibit species, but management-wise they do better, and the EAZA population is bigger.

Finally, an EEP for the Yellow-backed duiker (*Cephalophus sylvicultor*) was created as the species acts as an *ex situ* management model for other more threatened duiker species and has great research potential.

ACHIEVEMENTS DURING THE YEAR

The greatest achievement was, without a doubt, that the publication of the RCP in August 2022. The TAG would like to thank everyone involved whether it was in the first pre-RCP meetings, during the workshop or in writing the 425-page-strong document.

Yellow-backed duiker (*Cephalophus sylvicultor*) © Frankfurt Zoo

Impala (*Aepyceros melampus*) in Lewa Wildlife Conservancy, Kenya © Sebastian Weber

We feel we have succeeded in finishing a RCP that lives up to our mission. We have made a selection that makes sure we can manage most of the endangered species in human care in EAZA but we are also able to present institutions with a good variety of antelopes from different continents and of different sizes, looks and behaviours. The RCP summary is a must read for every institution holding antelopes and giraffids.

COLLABORATIONS

The AGTAG would like to thank La Hoya Experimental Station of Arid Zones (EEZA) - CSIC (Spain) for hosting the 2022 mid-year meeting. This was the TAG's first "in-person" meeting since the pandemic started. Apart from a very well-arranged meeting, we also were introduced to an institution with an impressive focus on research and conservation and witnessed the day-to-day management of the antelopes at the institution.

The TAG still has good cooperation with the IUCN SSC Antelope SG and IUCN SSC Giraffe and Okapi SG. They were pivotal throughout the decision-making process for the RCP, especially for the species we do not keep in EAZA. They will also help the EEPs to choose relevant projects for fundraising and help the upcoming "task force" decide where the TAG can be of assistance. The task force was decided on in the RCP and will be a group working within the TAG with the focus of delivering husbandry and/or small population management advice to *ex situ* breeding facilities in range countries. Another great example of how EAZA institutions can share their knowledge for the benefit of conservation.

Three members of the TAG leadership attended the joint TAG Chairs meeting in Long Beach (USA) in 2022. Before that, they joined our American counterparts in the AZA Antelope, Cattle, Giraffid and Camelid TAG for their mid-year meeting. This gave us an idea about how they prioritise, and made some of our RCP decisions stronger as we could see where our efforts will have the biggest impact.

CONSERVATION AND RESEARCH

The AGTAG's research and conservation coordinators keep the TAG up to date in these two fields. We hope to be able to continue to stimulate zoos' involvement in conservation and research, as we consider this a priority for the years to come. The goal is that, as a minimum, every EEP will be able to direct holders towards conservation projects with the best impact.

ADDITIONAL COMMENTS

The article "*Join the antelope movement*" in Zooquaria 116 presented some of the TAG's thought processes and the background for a lot of the decisions in our RCP. The full RCP can be found on the Population Management page of the EAZA Member Area.

Finally, we would like to send a special thank you to Klaus Müller-Schilling (Hannover Zoo, Germany), who went into a well-deserved retirement in 2022. Klaus has been an active member of the AGTAG for many years, was the champion of the small antelope species and kept several Studbooks over the years. We wish him all the best in the future.

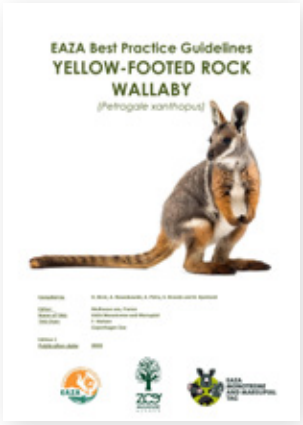
42 CAPRINAE

No report was submitted by the EAZA Caprinae TAG for 2022.

BEST PRACTICE GUIDELINES 2022

Thanks to the efforts of Programme Coordinators and TAG members, seven BPGs and three revised versions* were approved and published on the EAZA website in 2022.

Common skate complex • Crocodile monitor • Yellow-footed rock wallaby • Jaguar • Nycticebus species • Sand lizard • Chimpanzees • *Potomotyphlus* and *Typhlonectes* spp. Caecilians* • Callitrichidae* • Red panda*



Visit www.eaza.net/conservation/programmes for a complete overview of the available EAZA BPGs.

TAG Reports 2022

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