



EUROPEAN ASSOCIATION OF ZOOS AND AQUARIA

TAG Reports 2021



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Cover image

The Near-Threatened red-tailed amazon (*Amazona brasiliensis*) is difficult to breed in human care, however ARTIS Zoo (the Netherlands) has been successful in doing so and the EAZA Ex situ Programme for the species is now looking for new holders © ARTIS Zoo

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INTRODUCTION

This Annual Report provides a detailed overview of the diverse activities that EAZA's 42 Taxon Advisory Groups (TAGs) were involved in over the course of 2021.

This TAG Annual Report demonstrates successes and progress achieved across the EAZA TAGs in 2021. Of the 42 TAGs, all but the Coral TAG, Ratite TAG and Charadriiformes TAG were able to provide a report. Like in 2020, the COVID-19 pandemic continued to hamper the work of the TAGs. However, the TAGs have continued to show strong dedication and increased skills in using online platforms, resulting into the many and diverse activities described in this report.

The implementation of the still relatively new EAZA population management structure continued with Regional Collection Plan (RCP) meetings held online for Elasmobranchs, Reptile (Crocodilians), Raptors, Pigeon and Dove, Great Ape, Bear, Small Carnivore, Marine Mammals and Antelope and Giraffids. 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 2021, resulting from continued training capacity building of the EAZA Population Management Centre (PMC), the number of LTMP meetings increased significantly to more than 40. Additionally, even more so called pre-LTMP check-in meetings, aiming to prepare for the LTMP workshop, were held. The first EEPs on family level (including for various species of freshwater fish) were approved in 2021, recognising that one size does not fit all when managing species and (groups of!) individuals across a wide range of species and within varying contexts.

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 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, 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 Specialist Groups, stayed strong and continued to grow.

59 new style EEPs were approved bringing the total to 202 by the end of 2021. In addition to these, TAGs will continue to oversee 122 old style EEPs and 122 European Studbooks (ESB) until all have completed their new style RCP process.

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 nine BPG completed, approved and freely available on the EAZA website (www.eaza.net), 2021 was yet another productive year in this regard.

Significant progress was made by Species360 with the development of the so-called 'Social Group' functionality in ZIMS for Studbooks in 2021. The PMC as well as some TAGs and EEPs contributed to this work, and we are looking forward to migrating the remaining handful programmes into ZIMS in early 2022.

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 was no minor challenge on the agenda in 2021. Despite these challenges, we are optimistic to see a slow but steady increase in transports during the course of 2022 thanks to the hard work and persistence of the Members, EEPs and TAGs, and not least the strong collaboration with our colleagues at the British and Irish Association of Zoos and Aquariums (BIAZA).

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 2021.

GLOSSARY

AZA: Association of Zoos and Aquariums (USA)

BPG: Best Practice Guidelines

Chester Zoo: North of England Zoological Society (NEZS) / Chester Zoo (UK)

CITES: Convention on International Trade in Endangered Species

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, includes MON-T, MON-T REPLw, MON-T Phase out and MON-T DNO (see EAZA Population Manual in [EAZA Governing Documents](#) for more details)

RCP: Regional Collection Plan

SEAZA: Southeast Asian Zoo Association

SG: Specialist Group

SSC: Species Survival Commission

SSP: Species Survival Plan

TAG: Taxon Advisory Group

ZAA: Zoo and Aquarium Association (Australasia)

ZIMS: Zoological Information Management Software

ZSL: Zoological Society of London (UK)



The greater one-horned rhinoceroses (*Rhinoceros unicornis*) in Basel Zoo live in a mixed exhibit with small-clawed otters (*Aonyx cinerea*) and Visayan warty pigs (*Sus cebifrons*) © Basel Zoo

1 TERRESTRIAL INVERTEBRATE

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

INTRODUCTION

2021 proved to still be a difficult year, with travel restrictions preventing any face-to-face meetings of the EAZA Terrestrial Invertebrate TAG. Work continued in the background, though to a slightly lesser extent, but plans for 2022 are significantly busier.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

The 2021 Partula EAZA Ex situ Programme (EEP) inventory recorded 15 taxa (consisting of 13 species and two subspecies) totalling 8,925 animals in 11 collections. The annual Partula EEP Species Committee meeting was held and additional new participating institutions (Beauval Zoo and Marineland Antibes, both France, and Berlin Zoo, Germany) are in the process of being established.

As was the case in 2020, COVID-19 constraints prevented any reintroductions over 2021 but post-release monitoring was continued by the Direction de l'Environnement (France). Monitoring in the complex forest environment is very challenging but an analysis of monitoring data (2015-2021) by Partula EEP Scientific Advisor Justin Gerlach (Peterhouse Cambridge, UK) provided some encouraging results for the majority of the reintroduced species. Follow up reintroductions will hopefully be able to resume in 2022.

The *ex situ* research focus is on diet refinements and morphological analysis of the breeding population using the extensive preserved shell material and demographic records. *In situ* research is focused on the challenging post-reintroduction monitoring.

Best Practice Guidelines (BPG) for noble chafer (*Gnorimus nobilis*) were formally published this year and the ones for dragon-headed katydid (*Eumegalodon blanchardi*) should be approved in early 2022.

CONSERVATION AND RESEARCH

A new initiative between the Instituto das Florestas e Conservação da Natureza (Portugal), Mossy Earth, Chester Zoo and Bristol Zoo (all UK) began this year with the target to help prevent the extinction of several species of endemic snail on the island of Desertas Grande, Madeira. Currently three species (*Atlantica calathoides*, *Discula lyelliana*, *Geomitra grabhami*) are present in human care, with good breeding results already from the latter two species. A conservation strategy is currently in production and will come into force in 2022.



Geomitra grabhami at Bristol Zoo © Adam Button

2 FRESHWATER TELEOST

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

INTRODUCTION

A primary focus of the EAZA Freshwater Teleost TAG in 2021 was the recruitment of new Coordinators for the newly proposed family-based EEPs. Thirty families of freshwater teleosts were identified in late 2019 for EEP management, using the new “one size does not fit all” approach embraced by EAZA for the new EEPs. Due to the large number of species under the TAG’s remit, priority families were identified for management, based strongly around the number of species requiring conservation attention. After advertising the EEP Coordinator roles, 13 enthusiastic and dedicated people offered to help and put themselves forward as new EEP Coordinators. This includes a number of EAZA Members as well as European Union of Aquarium Curators (EUAC) members with EAZA Member sponsorship. To date six new EEPs have been approved, encompassing seven families - since the Regional Collection Plan (RCP) workshop one family has been split into two. So far this covers 558 species in these families, of which 144 are threatened and five already Extinct in the Wild and entirely dependent on good collaborative zoo and aquarium management for their survival.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

The TAG Chair and EEP Coordinator for Aphaniidae and Cyprinodontidae (pupfishes), Alex Cliffe (ZSL Whipsnade Zoo, UK), have been working closely with the Population Biologists in the EAZA Executive Office (EEO) to draft the first Long-Term Management Plan (LTMP) for freshwater teleosts. The pupfishes were selected for the first LTMP due to the number of challenging life history traits and management options available. These include: short lifespan, territorial behaviour, seasonal reproduction, sexual dimorphism, demanding water quality parameters and because many species are highly threatened and in need of urgent, well-planned *ex situ* management.

The pupfish EEP is currently formulating the LTMP for Pupfishes with Elmar Fienieg, Population Biologist at the EEO, to help implement an effective genetic management strategy. There are some refinements needed to strike a balance of maintaining genetic diversity but also manage the constraints of human care at each institution. A strategy to adapt to each institution is required to facilitate this EEP.

Holders of key pupfish species are being recruited and recently ZSL Whipsnade Zoo donated 7.13.0 La Palma pupfish (*Cyprinodon longidorsalis*) to Chessington Sea Life (UK) and 3.7.0 mezquital pupfish (*Cyprinodon meeki*) to Bristol Zoological Society (BZS, UK). ZSL Whipsnade Zoo was the only institution (currently on ZIMS) that houses this species so this was a priority move with BZS reporting successful breeding shortly after their arrival.

ACHIEVEMENTS DURING THE YEAR

The pupfish EEP is working with EAZA Population Biologists to create a robust LTMP for this EEP maximising the benefits of the population management models. Further discussion is taking place with other freshwater teleost EEP Coordinators, Markéta Rejlková (Poeciliidae EEP Coordinator, Ostrava Zoo, Czechia) and Michael Koeck (Goodeidae EEP Coordinator, Vienna Aquarium, Austria) to advise on current ZSL Whipsnade Zoo species that fall under these EEPs and how to support each one respectively.

Taxonomy revisions have resulted in a reclassification of the Turkish killifish genus from *Aphanius* to *Anatolichthys*.

COLLABORATIONS

The Valenciidae EEP Coordinator continues a close collaboration with the Hellenic Centre for Marine Research in Greece working *in situ* with the two Critically Endangered Balkan Valenciidae species. In addition to securing funding over two years from the A. G. Leventis Foundation (Greece) for ongoing eDNA monitoring that includes these two species, a PhD student is working on interactions between Valenciidae and the alien mosquitofish (*Gambusia holbrooki*). The team conducted a field translocation in November 2021, moving 40 individuals of Corfu killifish (*Valencia letourneuxi*) to a protected spring area in a key watershed. This group will now be monitored each year for reproduction and population growth. The achievements of the project, called Afresh, are documented on a new website: <https://afresh.hcmr.gr>.



Sakaraymi panchax (*Pachypanchax sakaraymi*) © Alex Cliffe



Mezquital pupfish (*Cyprinodon meeki*) © Alex Cliffe

ZSL Whipsnade Zoo worked closely with BZS on outcomes from a research project that investigated the use of one-way vinyl using the butterfly splitfin (*Ameba splendens*) to prevent this fish from becoming habituated to humans when in the aquarium. This project will be expanded for trials with other species at ZSL Whipsnade Zoo within the Pupfish and Killifish EEP.

Pupfish expert Chris Martin (University of California, USA) and other American colleagues on the Cyprinodontidae Working Group are conducting a review of the status of pupfish in private collections and zoos/aquariums and creating an accessible website to centralise a refined inventory. Chris has agreed to take on the role as EEP Advisor.

CONSERVATION AND RESEARCH

ZSL Whipsnade Zoo began a research project with ZSL Institute of Zoology on one-way vinyl projected on the bluetail goodea (*Ataeniobius toweri*), primarily to look at the promotion of natural behaviours with the potential of expanding this to pupfish and killifish species. The final report will be available in June 2022.

ZSL Whipsnade Zoo is investigating the potential of comparative studies of indoor and outdoor facilities for pupfish and killifish. This is at an early stage of development but assessing temperature, light and UV provisions in both applications will help gauge a clearer understanding of fish health, vigour, and fecundity.

ZSL has worked extensively in Southwestern Turkey focussing on the endemic killifish. Two species have been deemed a priority for further assessment. The Anatolian killifish (*Anatolichthys transgrediens*) from Lake Acigol and the Sultan Sazlığı killifish (*Anatolichthys danfordii*) from the Sultan Sazlığı Lake are both Critically Endangered but their status requires updating as it is feared that they could become Extinct in the Wild due to ongoing anthropogenic pressures. Collaborating with Jörg Freyhof (IUCN Freshwater Fish Specialist Group), and Baran Yoğurtçuoğlu, Assistant Professor at Hacettepe University (Ankara, Turkey), will help shape a full assessment of both lakes to ascertain their current status. Proposals and funding options are being formulated with the hope of surveys being carried out in 2022.

Baran also accepted the position of Advisor on the Cyprinodontidae and Aphaniidae EEP. His extensive work in Turkey with IUCN Red List assessments, research and comprehensive surveys of key killifish habitats will be a welcomed addition to this EEP.

3 MARINE TELEOST

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

INTRODUCTION

The EAZA Marine Teleost TAG is reviewing this taxonomical group to find species - in aquariums - that need higher levels of care or attention by the zoo and aquarium community. The TAG's specialists also take care of developing educational tools in connection with the taxonomical group.

ACHIEVEMENTS DURING THE YEAR

During 2021 several RCP preparation meetings were organised and a work schedule was accepted. The development of the TAG's mission statement also continued.

During the meetings the TAG Advisors agreed that the pre-check of all marine teleost families should be finished - with refreshing the data - before the evaluation process starts. The following families will be pre-checked during 2022: *Acanthuridae*, *Apogonidae*, *Callionymidae*, *Balistidae*, *Scorpaenidae*, *Grammatidae*, *Pomacentridae*, *Serranidae*, *Syngnathidae*. The start of the evaluation process is planned at the International Aquarium Congress to be held at Nausicaa (France) in October 2022.

OTHER DEVELOPMENTS

During the last year, Marie Bournonville (Aquarium-Muséum of Liège University, Belgium), the educational specialist of the TAG, and her colleagues started to develop two roleplay games - "Role Play Debate" and "The fisher's dilemma" - raising awareness of marine wildlife and associated issues. Both games will have two versions: one for children from 10 to 12 years old and another for teenagers from 16 to 18, according to the schools' programme (the game can be played by players of another age range). The TAG aims to have the games available for aquariums and schools in 2022.

"Role play debate" will focus on the sourcing of fish for the hobby trade and public aquariums and create a debate



Plate fish (*Bothus lunatus*) © Sóstó Zoo

around the question “Should people acquire wild or captive-bred animals?”. A fictional case about a proposed ban on fishing will be presented and players will role play various stakeholders (breeders, fishers, conservation scientists, sellers ...) who need to construct arguments, with the help of information and bonus cards.

“The fisher’s dilemma” is a strategy card game based on the Prisoner’s dilemma experience to discuss the difficulty in enforcing fishing quotas.

COLLABORATIONS

The TAG collaborated with the European Union of Aquarium Curators (EUAC) Disposition Working Group in preparation of the EUAC disposition guidelines for marine teleosts.

Members of the TAG are also taking part in the Transportation Working Group organised by EUAC. Its goal is to develop a set of overall professional guidelines for transporting aquatic species, this work is taking place via workshops and meetings.

4 ELASMOBRANCH

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

INTRODUCTION

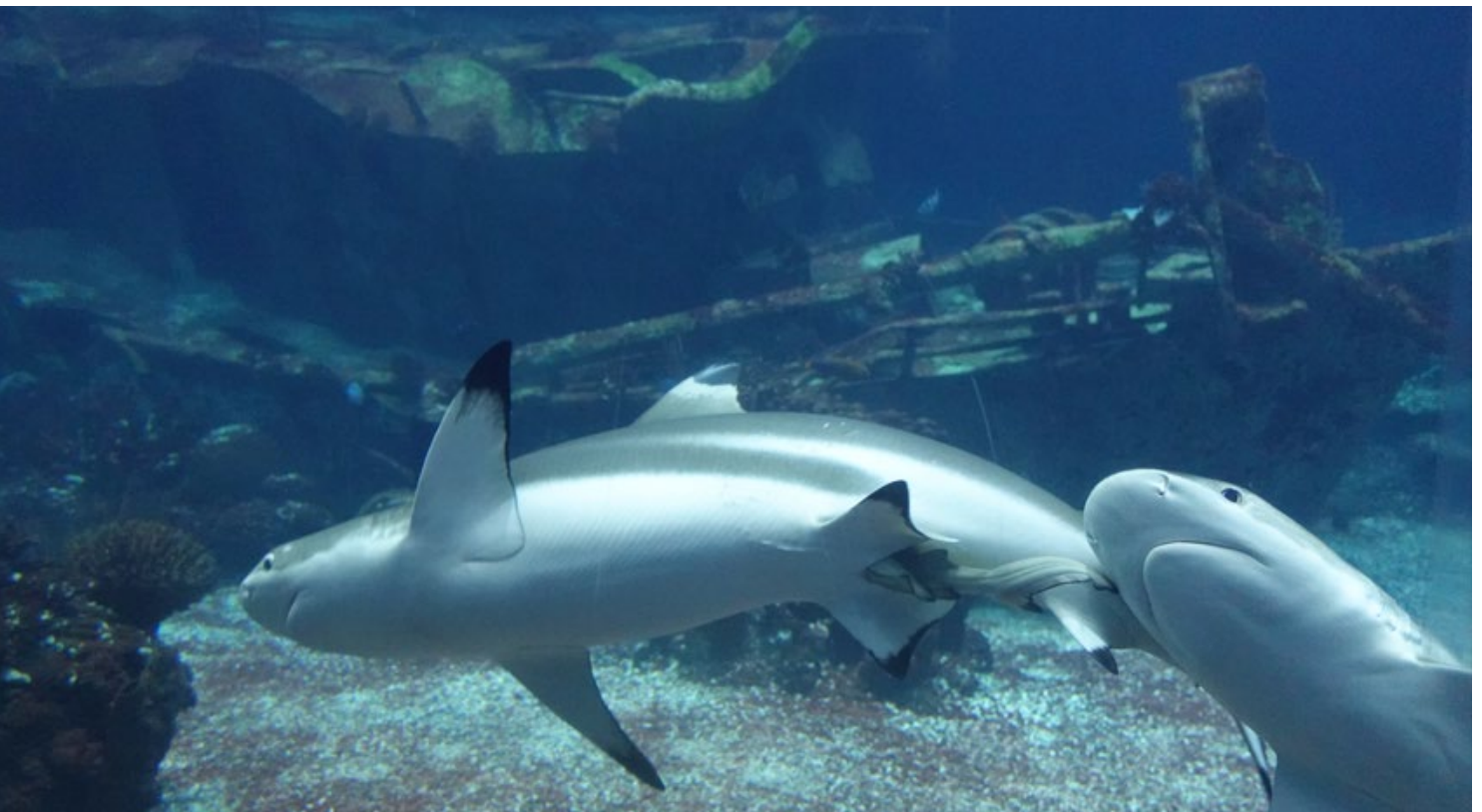
Due to the COVID-19 pandemic the activities of the different programmes within the EAZA Elasmobranch TAG were a little less than in other years. However, a lot still happened including RCP workshops, initiation of a Conservation Working Group, close collaboration with the IUCN Shark

Specialist Group (IUCN SSG) and the publication of the first Elasmobranch BPG.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

In 2021 two online RCP workshops were organised. Participants were elasmobranch species Programme Coordinators, representatives from the EEO, from the IUCN SSG and from the North American Association of Zoos and Aquariums (AZA). In total, 63 elasmobranch species were assessed for their role in aquariums. This species list consisted of current programme species defined at the earlier RCP in 2013, threatened species within the European region which are currently not kept and some new species which are kept in the European *ex situ* collection. The outcome of the 2021 workshop is a proposed list of 27 species to be managed at an EEP level. It was decided to have EEPs on a genus level for three species groups: *Mustelus* spp. (including *M. asterias* and *M. mustelus*), *Raja* and *Leucoraja* spp. (including *Raja brachyura*, *R. clavate*, *R. microocellata*, *R. montagui*, *R. radula*, *Leucoraja circularis* and *L. melitensis*) and *Pristis* spp. (including *P. 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 monitoring programmes (MON-P). However, for some a ‘species champion’ might be needed for further work on the species.

Three species were recommended as ‘Do Not Obtain’ (*Aetobatus narinari*, *Atelomycterus macleaya* and *Triakis scyllium*). Instead, it is advised to work with similar species: *Aetobatus ocellatus*, *Atelomycterus marmoratus* and *Triakis semifasciata*. In 2022, an official RCP document will be published with the final decisions for the different species.



Birth of a black tip reef shark (*Carcharhinus melanopterus*) © Max Janse / Royal Burgers’ Zoo

ACHIEVEMENTS DURING THE YEAR

The first BPG within the TAG were officially published in 2021 for the common skate (*Dipturus batis*), edited by the MON-P Coordinator Mark de Boer (Rotterdam Zoo, the Netherlands). At the RCP meeting, it was decided more species need BPG in the near future. Also, it was decided to work towards Best Practice Notes (BPN), which describes important species-specific husbandry information. BPN will increase the possibility to share knowledge on a lower profile than writing full BPG on each species, which may take a few years longer to realise.

COLLABORATIONS

Two people - Nuria Baylina (Oceanário de Lisboa, Portugal) and Max Janse (Royal Burgers' Zoo, the Netherlands) - from the TAG Steering Committee became members of the Northern Europe Regional Group of the IUCN SSG. With this, a closer collaboration with *in situ* activities might be set up. The Elasmobranch TAG was introduced, as a chapter with the title '*Managing an ex situ elasmobranch population in Europe*', published in the quarterly newsletter of the IUCN SSG. Within the IUCN SSG, a Public Aquarium Working Group was also set up in 2021. It is chaired by two AZA colleagues and with public aquarium representatives from Japan, Australia, Brazil, South Africa and Europe.

CONSERVATION AND RESEARCH

After a Conservation Elasmobranch Workshop organised by WWF Netherlands and Ark Foundation (the Netherlands) in 2021, the TAG felt it was important to start working more on conservation collaboration. In 2021 a conservation focus group was initiated as part of the TAG with the following major goals:

- Make an inventory of the conservation initiatives in European public aquariums on elasmobranchs
- Facilitate collaboration between *ex situ* managed species programmes within the TAG and *in situ* conservation projects
- Develop a list of possible contributions of public aquariums to *in situ* conservation programmes
- Develop steppingstones for a possible reintroduction programme
- Facilitate public aquarium conservation fund initiatives to help fund *in situ* conservation programmes
- Share conservation initiative results with the TAG participants

ADDITIONAL COMMENTS

The paper '*Elasmobranchs under human care. A feasibility study of an Institutional Collection Planning (ICP) without animals originating directly from the wild*' was published in the Journal of Applied Animal Ethics Research by Max Janse and Nienke Klerks (both Royal Burgers' Zoo). This paper showed the feasibility of an ICP with only surplus and born in human care specimens. The authors discussed the possibility and challenges of extrapolating this towards the European aquarium community. Even though breeding in human care has increased drastically in the last decade within the elasmobranch *ex situ* population, partly because of the active management of the species programmes, there still remains a need for wild retrieved founders and a further increase of breeding.

5 CORAL

No report was submitted by the EAZA Coral TAG for 2021.

6 JELLYFISH

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

INTRODUCTION

The year 2021 continued to be haunted by the pandemic which impacted the work of the EAZA Jellyfish TAG. It especially led to a lower response of collaboration to complete the Jellyfish TAG database (www.jellyfishtag.com).

ACHIEVEMENTS DURING THE YEAR

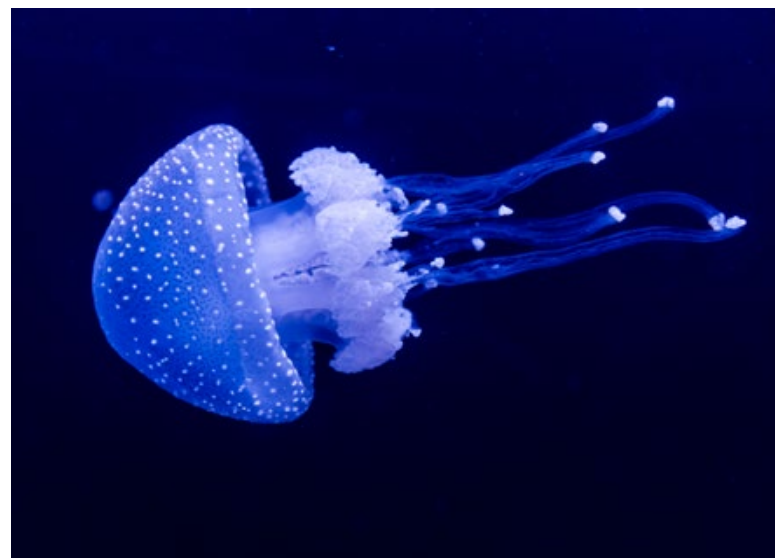
Despite few updates in the database, the number of requests for information on the production of different species increased and various information was shared. One collaboration, an update about the production of *Phyllorhiza punctata*, was added to the database.

The TAG discussed with different jellyfish specialists how to create and how to best display an Available/Wanted list for this particular group of animals. This will be presented during 2022.

The TAG participated in the online EAZA Annual Conference and presented the project and latest achievements made in 2020.

COLLABORATIONS

One additional specialist contributed to the Jellyfish database, Jesper Flygare from the Malmö Museum aquarium (Sweden). The database now contains information on how to produce and maintain 16 species of jellyfish: *Aurelia aurita*, *Cassiopea sp.*, *Cassiopea andromeda*, *Chrysaora fuscescens*, *Chrysaora pacifica*, *Chrysaora plocamia*, *Chrysaora quinquecirrha*, *Cotylorhiza tuberculata*, *Leuckartiara octona*, *Lychnorhiza lucerne*, *Pelagia noctiluca*, *Phacellophora camtschatica*, *Phyllorhiza punctata*, *Rhizostoma pulmo*, *Rhopilema esculentum* and *Stomolophus meleagris*.



Phyllorhiza punctata at Oceanário de Lisboa © Hugo Batista

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) in 2021.

One big achievement of the year was the delivery of a Massive Open Online Course on the salamander chytrid *Batrachochytrium salamandrivorans (Bsal)* by the ATAG and the EEO and funded by the Morris Animal Foundation (USA). The course, to which 455 participants registered, has four modules and introduces *Bsal*, veterinary aspects, *ex situ* conservation and a call for action. The course is still available at time of publication, check www.eaza.net/academy/courses for more information.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

The EEP for Mountain chicken (*Leptodactylus fallax*) supported bioacoustic research.

BPG were published for the achoque (*Ambystoma dumerilii*) and fire salamander (*Salamandra salamandra*). The RCP for dendrobatid frogs is planned for 2022.

COLLABORATIONS

The ATAG collaborated with different academic, government and non-government organisations to realise the objectives of different conservation and research projects (see below).

CONSERVATION AND RESEARCH

The mountain chicken recovery programme (Jersey Zoo, Chester Zoo, Bristol Zoo, ZSL London Zoo, all UK; and Nordens

Ark, Sweden) advises on the captive-bred frogs exported to Montserrat and housed in semi wild enclosures. Out of the 27 translocated frogs, 22 are surviving.

A collaboration between Paris Zoo (France), Sarajevo University (Bosnia and Herzegovina) and French private breeders on the Bosnian alpine newt (*Ichthyosaura alpestris reiseri*) found that 1) it still survives in the wild close to the type locality, 2) the *ex situ* population is genetically similar to wild specimens, 3) genetic comparison with other Balkan populations of *Ichthyosaura* concluded that *I. a. reiseri* constitutes a genetically distinct subgroup and is restricted to mount Vranica.

Barcelona Zoo (Spain) reintroduced 59 Mallorcan midwife toads (*Alytes muletensis*) into their natural habitat in Mallorca and received 26 new individuals from Mallorca as founders for a new breeding population. The 10th *A. muletensis* Technical Conference was held under the direction of the Balearic Government with the assistance of Barcelona Zoo. They also successfully reared larvae of both races of Montseny brook newt (*Calotriton arnoldi*) and released 79 individuals into natural habitats.

ZSL London Zoo worked with Amphibian and Reptile Conservation and Natural England (UK) to support head starting of pool frog (*Pelophylax lessonae*) tadpoles as part of the pool frog recovery programme through husbandry consultation, disease risk assessment, health surveillance, and engagement in a strategy planning workshop. The Zoo also described two amphibians new to science; contributed to Red List Assessments of Southeast Asian amphibians, supported African and Asian Amphibian EDGE Fellows and developed a collaboration with Green Camel Bell (China) focused on Chinese giant salamanders (*Andrias davidianus*) in Gansu Province.



World first breeding of the Ninh Thuan narrow-mouth frog (*Microhyla ninthuanensis*) at Cologne Zoo © Anna Rauhaus



Copenhagen Zoo's Natterjack toad (*Epidalea calamita*) radiotelemetry pilot project began in 2021 © Lene Vestergren Rasmussen

Vienna Zoo (Austria) collaborated with Brown University and Smith College (USA) on foot-flagging frogs to investigate the influence of androgens on the visual and acoustic display and how physiological factors associated with signal production influence visual displays as well as the evolutionary mechanisms of signal development and design. The zoo worked with the University of Veterinary Medicine and other stakeholders to undertake *Bsal* screening in six of the nine Austrian states. All samples were *Bsal* negative. In addition, sampling of private keeper-stock in the past three years yielded no *Bsal* infections.

Nordens Ark bred and released 50,000 green toad (*Bufo viridis*) tadpoles to former natural ranges on the island of Öland, Sweden. Ten additional founder animals from a new, un-sourced population were brought to the *ex situ* facility at the zoo. Field surveys and a small-scale citizen science project were established for *B. viridis* on Öland. Copenhagen Zoo (Denmark) and Nordens Ark participated in a range wide study to sequence *B. viridis* populations to determine the level of kinship and to locate the most suitable populations for possible *ex situ* conservation breeding. Nordens Ark worked with administration boards in Southern Sweden and Uppsala University to obtain a reference genome for the species helpful for future *ex situ* breeding efforts.

Copenhagen Zoo released 27,700 tadpoles, 329 metamorphs and 4 eggs strings from Natterjack toads (*Epidalea calamita*), 30,000 tadpoles and 168 metamorphs from *B. viridis* and 1,677 fire bellied toad (*Bombina orientalis*) tadpoles. Tadpoles were released in newly man-made or restored ponds in collaboration with local landowners and municipalities. A radiotelemetry project on *E. calamita* was initiated and will be expanded to assess the movement patterns in fragmented habitats. The zoo reports that *B. viridis* - released as tadpoles - have colonised six ponds in Northern Zealand.

Cologne Zoo (Germany) bred 12 amphibian species, including Taylor's tree frog (*Kurixalus bisacculus*), Ziegler's crocodile newt (*Tylototriton zieglerei*), Vietnamese crocodile newt (*T. vietnamensis*), Solomon Island leaf frog (*Cornufer guentheri*), and the Ninh Thuan narrow-mouth frog (*Microhyla ninhthuanensis*). Specimens of several species went to private owners for the Citizen Conservation initiative. The zoo continued its commitment to Cologne's *B. viridis* population; tadpoles taken from nature in Leverkusen-Cologne were raised in the permanent exhibition and breeding station and 1,400 young toads were released at the end of the season. Thomas Ziegler (Cologne Zoo) gave a lecture about the zoo's commitment to *ex situ* conservation of Southeast Asian amphibians and reptiles as an implementation of the IUCN One Plan Approach at the International Academic Conference on Herpetological Biodiversity and Conservation in Eurasian Countries in Chengdu (China). The zoo also advised and financially supported partners in Vietnam and Laos. The Vietnamese-German team described four new Vietnamese frogs.

Chester Zoo collaborated with Madagasikara Voakajy (Madagascar) in delivering the Action Plan for the Harlequin mantella (*Mantella cowanii*). A Malagasy conservationist started his PhD on microhabitat preferences, behaviour and impact of climate change integrating *in situ* and *ex situ* research. Chester Zoo reared larvae from the Oriental population of *Calotriton arnoldi* and will release them once the difficulties of transferring caudata between the EU and UK have been resolved. The bleeding toad (*Leptophryne cruentata*) conservation team surveyed the wild populations of all three congeneric species in Java (Indonesia) and are studying the population status and ecology of the threatened one. Conservation of *A. dumerillii* in collaboration with Michoacan University's Fish Ark team (Mexico) finalised a 2018-2021 research project with stakeholders, incorporating social, environmental, educational, and economic considerations.



Fire salamander (*Salamandra salamandra*) encountered during Vienna Zoo's Bsal screening in the Vienna woods © Marc Sztatetscny

Research activities shall continue, to propose and implement actions for the long-term conservation of the species and its habitat inclusive of translocations.

ADDITIONAL COMMENTS

Members of the TAG were involved in the following publications:

- Anderson, N. et al. (2021). *A common endocrine signature marks the convergent evolution of an elaborate dance display in frogs*. *The American Naturalist*, 198: 522-539
- Anderson, N. et al. (2021). *Testosterone amplifies the negative valence of an agonistic gestural display by exploiting receiver perceptual bias*. *Proceedings of the Royal Society B*, 288: 20211848
- Anderson, N. et al. (2021). *Insight into the Evolution of Anuran Foot Flag Displays: A Comparative Study of Color and Kinematics*. *Ichthyology & Herpetology*, 109: 1047-1059
- Ashpole, I.P. et al. (2021). *A retrospective review of post-metamorphic mountain chicken frog (*Leptodactylus fallax*) necropsy findings from European zoological collections, 1998 to 2018*. *Journal of Zoo and Wildlife Medicine*, 52: 133-144
- Bernardes, M. et al. (2021). *Multiple newt threats – occurrence of *Paramesotriton deloustali* and *P. guangxiensis* in differently disturbed habitats in Vietnam including new data on the parasite-host relationships with water mites*. *Limnologica*, 88: 1-8

- Carter, K.C. et al. (2021). *Investigating the effect of disturbance on prey consumption in captive Congo caecilians *Herpele squalostoma**. *Journal of Zoological and Botanical Gardens*, 2: 705-715
- Garcia, G., Tapley, B. and Marquis, O. (2021). *Amphibian Action Plan*. *Zooquaria*, 112: 12-13
- Hoang, C.V. et al. (2021). *A new species of *Vietnamophryne* from Vietnam*. *Revue Suisse de Zoologie*, 128: 207-219
- Hoang, C.V. et al. (2021). *Two new cryptic species of *Microhyla Tschudi, 1838 (Amphibia, Anura, Microhylidae)* related to the *M. heymonsi* group from central Vietnam*. *ZooKeys*, 1036: 47-74
- Hudson, M.A. et al. (2021). *First Detection of the Amphibian Chytrid Fungus *Batrachochytrium dendrobatidis* in Guadeloupe: Implications for Conservation*. *Herpetological Review*, 52: 765-768
- Jacken, A., Rödder, D. and Ziegler, T. (2021). *Distribution Patterns of Threatened Amphibians in the Zoo and Aquarium Community: A Call to Action*. *FrogLog*, 122: 12-13
- Le, D.T. et al. (2021). *New records and an updated checklist of amphibians and snakes from Tuyen Quang Province, Vietnam*. *Bonn zoological Bulletin*, 70: 201-219
- Le, D.T. et al. (2021). *New records of frogs from Quang Nam Province, central Vietnam*. *Herpetology Notes*, 14: 317-324
- Luong, A.M. et al. (2021). *New records and an updated checklist of amphibians from Lai Chau Province, Vietnam*. *Check List*, 17: 1-14
- Mudke, M. and Tapley, B. (2021). *Nesting frogs, the breeding biology of *Indirana cf. tysoni* (Anura: Ranixalidae), Western Ghats, India*. *Herpetological Bulletin*, 155: 2-7
- Nguyen, L.T. et al. (2021). *A new species of *Leptobranchella* (Anura, Megophryidae) from Mount Pu Ta Leng, northwest Vietnam*. *Zootaxa*, 5016: 301-332
- Nguyen, T.V. et al. (2021). *A new species of *Vietnamophryne* with an extended description of *Vietnamophryne orlovi**. *Russian Journal of Herpetology*, 28: 355-368
- Passos, L., Garcia, G. and Young, R. (2021) *Do captive golden mantella frogs recognise wild conspecifics calls? Responses to the playback of captive and wild calls*. *Journal of Zoo and Aquarium Research*, 9 (1)
- Rauhaus, A. and Ziegler, T. (2021). *Tylototriton vietnamensis Böhme, Schöttler, Nguyen & Köhler, 2005 – Vietnamesischer Krokodilmolch*. In: Grosse, W.-R. (Hrsg.): *Gefährdete Molch- und Salamanderarten – Richtlinien für Erhaltungszuchten*, Band 3. *Mertensiella*, 30: 212-225
- Smith, S.M. et al. (2021). *Androgen Receptor Modulates Multimodal Displays in the Bornean Rock Frog (*Staurois parvus*)*. *Integrative and Comparative Biology*, 61: 221-230
- Šunje, E. et al. (2021). *A revised phylogeny of Alpine newts unravels the evolutionary distinctiveness of the Bosnian alpine newt – *Ichthyosaura alpestris reiseri* (Werner, 1902)*. *Amphib-Reptilia*, 42: 481-490
- Tapley, B. et al. (2021). *Oviposition sites of the Hoang Lien horned frog *Megophrys hoanglienensis* (Tapley et al., 2018)*. *Herpetology Notes*, 14: 937-939
- Tapley, B. et al. (2021). *A new potentially Endangered species of *Megophrys* from Mount Ky Quan San, northwest Vietnam*. *Journal of Natural History*, 54: 2543-2575
- Zhang, Y. et al. (2021). **Amolops caelumnoctis* Rao & Wilkinson, 2007, a Junior Synonym of *A. splendissimus* Orlov & Ho, 2007 (Amphibia: Anura: Ranidae)*. *Zootaxa*, 5057: 181-200

8 REPTILE

TAG Chair: Ivan Reháč (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 2021, the EAZA Reptile TAG (RTAG) consisted of 31 members and three Advisors. It maintained 20 EEPs and 22 European Studbooks (ESBs) with a wide geographical representation of involved zoos.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

The Crocodile RCP was successfully held in 2021, with guest crocodile experts from AZA, Zoo and Aquarium Association (ZAA) and the IUCN Crocodile SG.

The BPG for European pond turtle (*Emys orbicularis*), sea turtles (Cheloniidae) and crocodile monitor lizard (*Varanus salvadorii*) and the LTMP for *Mauremys* sp. were published. Following the 2019 Chelonia RCP, additional new EEPs were approved in 2021 for: Aldabra giant tortoise (*Aldabrachelys gigantea*), Burmese star tortoise (*Geochelone platynota*), Indian star tortoise (*Geochelone elegans*) and Asian box turtle (*Cuora amboinensis*).

Among other, the Galapago tortoise and Burmese mountain tortoise EEPs selected representatives for the Species Committees.

The *Mauremys* sp. EEP held in June its first Species Committee meeting. Furthermore, the programme participated in a molecular study of *Mauremys sinensis* to establish how many different clades the species has. Also, they assisted the German authorities in the Evaluation of Captive Breeding Potential of selected CITES-I Chelonians, a project sponsored by the German Government's Federal Agency for Nature Conservation (BfN) and coordinated by the German Herpetological Society (DGHT). Finally, they assisted Spanish Government with large turtle seizure and started a collaboration with AZA institutions with *Mauremys nigricans*. Just before retiring from his position, Jan Vermeer (Parc Animalier de Sainte-Croix, France) published an updated Studbook for the European pond turtle.

ACHIEVEMENTS DURING THE YEAR

Many remarkable breeding successes occurred in 2021, such as the Ethiopian mountain adder (*Bitis parviocula*) and big-headed turtle (*Platysternon megacephalum*) at ZSL London Zoo (UK), as well as the successful natural breeding of the Philippine crocodile (*Crocodylus mindorensis*) – a video of the latter is available on www.reversethere.org – and the breeding of the confiscated Critically Endangered Burmese star tortoise in Cologne Zoo (Germany).

Another example of how zoos can reverse confiscations into breeding and conservation success, came from Vienna Zoo (Austria) which welcomed about 80 chameleons of several species from Tanzania, confiscated at the airport. Thanks to exemplary efforts from the staff, some of the



Female Philippine crocodile (*Crocodylus mindorensis*) with her young at Cologne Zoo © Anna Rauhaus

confiscated females laid eggs, respective husbandry sheets were produced and a good basis established for future *ex situ* breeding projects.

Münster Zoo (Germany) focused on finding and encouraging zoos to cooperate in keeping Critically Endangered chelonians, started to get funding for reintroduction *Indotestudo elongata*, and started a breeding project with Prigen (Indonesia) on *Leucocephalon yuwonoi*.

RTAG members were actively involved in the “Zoo Animal of the Year” campaign, dedicated to the crocodile. This is a joint campaign by the Zoological Society for the Conservation of Species and Population (ZGAP) together with the Association of German-speaking Zoological Gardens (VdZ) and other partners (all Germany). The funds collected by zoos over the year are used for effective conservation measures for highly threatened crocodile species in Borneo, Cuba, Nepal and in the Philippines.

Thomas Ziegler (Cologne Zoo) gave a lecture about *ex situ* conservation in Chengdu, China (see Amphibian TAG report) and was the Desktop Reviewer at the UNESCO World Natural Heritage Site Nomination Ha Long Bay - Cat Ba Archipelago, Vietnam.

COLLABORATIONS

The RTAG furthered the cooperation with partners from other regional zoo associations and continued to develop a close cooperation with the IUCN Specialist Group (SG) and Task Forces (TF) – in particular the Crocodile SG, Iguana SG, Monitor Lizard SG, Skink SG, Tortoise and Freshwater Turtle SG, Viper SG, CSG Tomistoma TF, Turtle Conservation Alliance – plus other international conservation initiatives (e.g. Gharial Conservation Alliance, Gharial Ecology Project, Asian Turtle Conservation Network, Blue Iguana Recovery Programme).



Male *Rhampholeon acuminatus* at Vienna Zoo © Rupert Kainradl

The RTAG participated in projects with external partners including:

- the Coordinator of Philippine crocodile ESB was appointed as an Advisor of the Ironwood Foundation (Indonesia) and as a member of the Advisory Council of the German Species Conservation Foundation
- Paris Zoo, La Rochelle University, CEBC, CNRS (all France) and Vienna Aquarium (Austria) finalised a project focused on environmental contamination by mercury and possible consequences on four species of caimans in French Guiana
- Cologne Zoo continued to support its partners in Vietnam and Laos such as the Melinh Station of IEBR (Vietnam) where many threatened taxa (eg *Mauremys annamensis*, *Indotestudo elongata* or *Goniurosaurus huuliensis*) bred in 2021 and the Mabuwaya Foundation (Philippines) committed to the conservation of Philippine crocodiles
- The ZSL herpetology team supported EDGE Fellow Ayushi Jain in the development of incubation techniques for Cantor's giant softshell turtle (*Pelochelys cantorii*) in India; continued to work with the Asian Turtle Programme in Vietnam as well as with Nordens Ark (Denmark) and Paignton Zoo (UK) in the development of rehabilitation and rescue protocols for big-headed turtles seized from the illegal wildlife trade
- A highly topical climate change-related research collaboration between Cologne Zoo, Bonn Museum Koenig (Germany) and the Truong Quang Nguyen's team focused on the effects of climate change on threatened Vietnamese reptile species

CONSERVATION AND RESEARCH

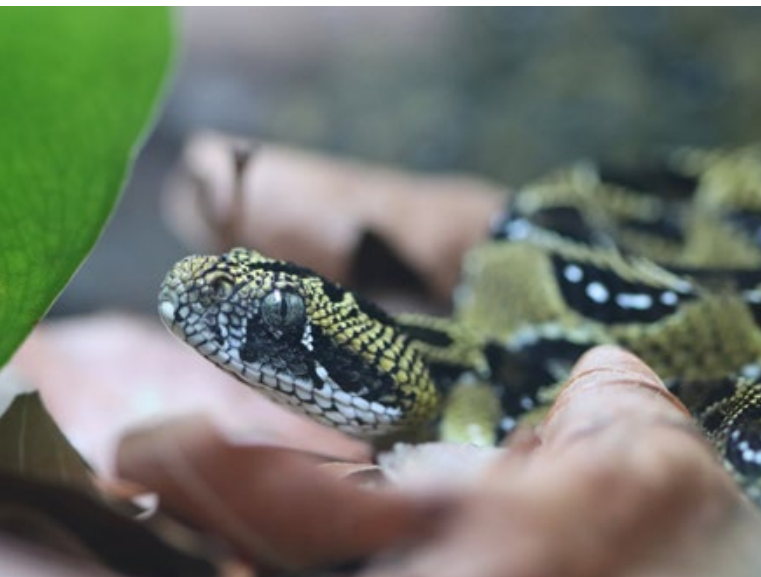
Some of our breeding programmes have significant research and conservation parts.

For instance, the EEPs for *Cuora* I and II participated in cytogenetic analysis of *Cuora* turtles and the Cuban boa ESB keeper coordinated molecular research to re-evaluate the management measures for the *ex situ* population.

The population survey of *Paleosuchus trigonatus* - initiated in 2016 in La Réserve des Nouragues (French Guiana) and involving Paris Zoo - continued in 2021. In November, more than 50 individuals had been individually sampled, marked and released.

Jersey Zoo (UK) conducted field monitoring and genetic sampling on the Montserrat iguana (*Iguana melanoderma*) to determine any management needs and whether invasive green iguanas (*I. iguana*) and hybrids are present on the island. The zoo assisted the National Trust on Anguilla on translocation of Lesser Antillean iguanas (*I. delicatissima*) from Dominica to Prickly Pear Island and on conservation plans for the Anguilla Bank skink (*Spondylurus powelli*).

Vienna Zoo became the Coordinator of the impressive *Batagur baska* project in collaboration with the Turtle Alliance, Turtle Island and respective authorities in Bangladesh – another project promoted by Reverse the Red. This project is perfectly in line with the One Plan Approach recommending the effective interaction of *in situ* and *ex situ* measures and expert groups.



Hatchling of the Ethiopian viper (*Bitis parviocula*) at ZSL London Zoo
© Benjamin Tapley

ADDITIONAL COMMENTS

Members of the TAG were involved in the following publications issued in 2021:

- Carter, K.C. et al. (2021). *The effect of visitors on zoo reptile behaviour during the COVID-19 Pandemic*. Journal of Zoological and Botanical Gardens, 2: 664-676
- Carter, K.C. et al. (2021). *Age-dependent enclosure use in juvenile Chinese crocodile lizards, Shinisaurus crocodilurus crocodilurus*. Journal of Zoological and Botanical Gardens, 2: 406-415
- Clemente, L. et al. (2021). *Cytogenetic Analysis of the Asian Box Turtles of the Genus Cuora (Testudines, Geoemydidae)*. Genes, 12: 156
- Chapple, D.G. et al. (2021). *Conservation status of the world's skinks (Scincidae): Taxonomic and geographic patterns in extinction risk*. Biological Conservation, 257: 1-12
- David, P. et al. (2021). *A revision of the dark-bellied, stream-dwelling snakes of the genus Hebius (Reptilia: Squamata: Natricidae) with the description of a new species from China, Vietnam and Thailand*. Zootaxa, 4911(1): 001-061
- Do, Q.H. et al. (2021). *A new species of Hemiphyllodactylus Bleeker, 1860 (Squamata: Gekkonidae) from Da Lat Plateau, Vietnam*. Zootaxa, 5023(1): 093-106
- Do, Q.H. et al. (2021). *A new species of Cyrtodactylus (Squamata: Gekkonidae) from Ninh Thuan Province, southern Vietnam*. Zootaxa, 4999(1): 058-076
- Gewiss, L.R. et al. (2021). *Photographic identification of Cnemaspis psychedelica: a useful tool to improve the regulation of international wildlife trade*. Herpetological Conservation and Biology, 16(1): 142-149
- Grismer, L.L. et al. (2021). *Molecular phylogenetics, PCA, and MFA recover a new species of Cyrtodactylus (Squamata: Gekkonidae) from an isolated sandstone massif in northwestern Cambodia*. Zootaxa 4949 (2): 261-288
- Grismer, L.L. et al. (2021). *Phylogeny and evolution of habitat preference in Goniurosaurus (Squamata: Eublepharidae) and their correlation with karst and granite-stream-adapted ecomorphologies in species groups from Vietnam*. Vertebrate Zoology, 71: 335-352

- Hoang, H. et al. (2021). *Hunting and trade of big-headed turtles (Platysternon megacephalum Gray 1831) in two protected areas in northern Vietnam*. Herpetology Notes, 14: 1077-1085
- Kane, D. et al. (2021). *Bungarus fasciatus (Banded Krait) and Trimeresurus cardamomensis (Cardamom Mountains Green Pitviper). Diet and predation*. Herpetological Review, 52: 564-566
- Kane, D. et al. (2021). *Reproduction of Lachesis stenophrys (Central American bushmaster) at ZSL London Zoo*. Herpetological Review, 52: 659-660
- Le, D.T. et al. (2021). *New records and an updated checklist of amphibians and snakes from Tuyen Quang Province, Vietnam*. Bonn Zoological Bulletin, 70 (1): 201-219
- Le, D.T. et al. (2021). *First record of the Cyrtodactylus brevipalmatus group (Squamata: Gekkonidae) from Vietnam with description of a new species*. Zootaxa, 4969 (3): 492-510
- Lemaire, J. et al. (2021). *Variation of Total Mercury Concentrations in Different Tissues of Three Neo-tropical Caimans: Implications for Minimally Invasive Biomonitoring*. Arch Environ Contam Toxicol, 81: 15-24
- Lemaire, J. et al. (2021). *Influence of sex, size and trophic level on blood Hg concentrations in Black caiman, Melanosuchus niger (Spix, 1825) in French Guiana*. Chemosphere, 262: 127819
- Lemaire, J. et al. (2021). *I got it from my mother: Inter-nest variation of mercury concentration in neonate Smooth-fronted Caiman (Paleosuchus trigonatus) suggests maternal transfer and possible phenotypical effects*. Environmental Research, 194: 110494
- Lemaire, J. et al. (2021). *Lead, mercury, and selenium alter physiological functions in wild caimans (Caiman crocodilus)*. Environmental Pollution, 286: 117549
- Manalo, R. et al. (2021). *Repatriation of Philippine crocodiles from Cologne Zoo to the Philippines*. Crocodile Specialist Group Newsletter, 39(4): 16-18
- Mobaraki, A. et al. (2021). *Conservation status of the mugger (Crocodylus palustris): Establishing a task force for a poster species of climate change*. Crocodile Specialist Group Newsletter, 40(3): 12-20
- Ngo, H.N. et al. (2021). *Modeling the environmental refugia of the endangered Lichtenfelder's Tiger Gecko (Goniurosaurus lichtenfelderi) towards implementation of transboundary conservation*. Frontiers of Biogeography, 13(4), e51167
- Ngo, H.N. et al. (2021). *Vulnerability of an endemic Tiger Gecko (Goniurosaurus huiliensis) to climate change: modeling environmental refugia and implications for in situ conservation*. Salamandra, 57(4): 464-474
- Ngo, H.N. et al. (2021). *A morphological and molecular review of the genus Goniurosaurus, including an identification key*. European Journal of Taxonomy, 751: 38-67
- Nguyen, T.H. et al. (2021). *A new species of Dixonius (Squamata: Gekkonidae) from Vientiane Capital, Laos*. Zootaxa, 4965 (2): 351-362
- Nguyen, T.Q. et al. (2021). *Bedrohtes Biodiversitätspotential der südvinamesischen Insel Hon Khoai – Lebensraum des endemischen und stark bedrohten Psychedelischen Felsengeckos (Cnemaspis psychedelica)*. Mitteilungen Zoologische Gesellschaft für Arten- und Populationsschutz e. V., 37(1): 17-22
- Ostrowski, S. et al. (2021). *A new Cyrtodactylus (Squamata: Gekkonidae) from Binh Thuan Province, southern Vietnam*.



Feeding confiscated chameleons at Vienna Zoo © Rupert Kainradl

European Journal of Taxonomy, 731: 47–70

- Rauhaus, A. et al. (2021). *Haltung und Nachzucht der vom Aussterben bedrohten Burmesischen Sternschildkröte Geochelone platynota im Kölner Zoo, Deutschland*. Sauria, Berlin, 43(2): 13–26

- Rauhaus, A. and Ziegler, T. (2021). *A note on longevity in the Quince Monitor in a European zoo and potential needs for maintaining a sustainable population under human care*. Biawak, 14(1-2): 32-34

- Sitthivong, S. et al. (2021). *A new species of the Gekko japonicus group (Squamata: Gekkonidae) from Khammouane Province, central Laos*. Zootaxa, 5082(6): 553–571

- Souvannasy, P. et al. (2021). *Camera trap confirmation of another Siamese crocodile (Crocodylus siamensis) population in Khammouane Province, central Lao PDR, with notes on conservation planning*. Crocodile Specialist Group Newsletter, 40 (3): 22-24

- Wagner, P. et al. (2021). *A new species of the Acanthocercus atricollis (SMITH, 1849) complex (Squamata, Agamidae)*. Salamandra, 57: 449-463

- Wagner, P. et al. (2021). *Integrative approach to resolve the Calotes mystaceus Duméril & Bibron, 1837 species complex (Squamata: Agamidae)*. Bonn Zoological Bulletin, 70: 141–171

- Wagner, P. et al. (2021). *A new agamid lizard from Myanmar*. Cretaceous Research, 124: 104813

- Wahle, A. et al. (2021). *Skinks in Zoos: A global approach on distribution patterns of threatened Scincidae in zoological institutions*. Global Ecology and Conservation, 30: e01800

- Youngman, N. J. et al. (2021). *Widespread and Differential Neurotoxicity in Venoms from the Bitis Genus of Viperid Snakes*. Neurotoxicity Research, 39 (3): 697–704

- Ziegler, T. (2021). *Conservation breeding projects of threatened Southeast Asian amphibian and reptile species at*

the herpetology department of the Cologne Zoo implementation of the IUCN's One Plan Approach. Programme, International Academic Conference on Herpetological Biodiversity and Conservation in Eurasian Countries, Chengdu, China, 2 to 5 November: 87-91

- Ziegler, T. et al. (2021). *Die Gefleckte Weichschildkröte und der "One Plan Approach"*. DATZ, 74(1): 76-81

- Ziegler, T. et al. (2021). *Repatriation of Philippine Crocodiles from Europe for Reintroduction into the Wild*. WAZA News, (1): 12-14

- Ziegler, T. and Rauhaus, A. (2021). *Der Aufbau des Europäischen Erhaltungszuchtprogramms für das vom Aussterben bedrohte Philippinenkrokodil – von der Ersatzbank bis zur Wiederauswilderung*. Mitteilungen Zoologische Gesellschaft für Arten- und Populationsschutz e. V., 37(1): 8-13

- Ziegler, T. and Rauhaus, A. (2021). *Von der Mutter aufgezogen Erneute Naturbrut bei den vom Aussterben bedrohten Philippinenkrokodilen*. Kölner Zoo Magazin, Herbst / Winter 2021 / 2022, 16: 12-15

Members of the TAG supervised the following student theses that finished in 2021:

- Kamphausen, J. (Master of Education Thesis, University of Cologne, Germany): *Threatened herpetological hotspot Madagascar – are Conservation breeding measures an alternative?*

- Lemaire, J. (PhD Thesis, La Rochelle University, France): *Mercury contamination in caimans from French Guiana, bioaccumulation and physiological effects*

- Wahle, A. (Bachelor Thesis, University of Cologne, Germany): *Skinks in Zoos: A global approach on distribution patterns of threatened Scincidae in Zoological Collections*

9 RATITE

No report was submitted by the EAZA Ratite TAG for 2021.

10 PENGUIN

TAG Chair: Pierre de Wit (WILDLANDS Emmen, Emmen, the Netherlands) • Vice Chair: Jo Elliott (Edinburgh Zoo, Edinburgh, United Kingdom)

INTRODUCTION

As a result of the RCP workshop in December 2020, a new RCP was published by the EAZA Penguin TAG in 2021. It was decided that all currently managed species would be transferred to a new style EEP to fulfil the agreed roles, as well as establishing a new EEP for the Magellanic penguin (*Spheniscus magellanicus*). Both tasks have been accomplished in 2021.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

Apart from being transferred to a new style EEP, the TAG recommended that the Northern rockhopper (*Eudyptes moseleyi*) and Southern rockhopper (*E. chrysocome*) penguins become one actively managed programme to overcome the

challenges of both populations and manage them optimally. The Southern rockhopper penguin EEP population is very likely to decline in the following years if the number of hatches is not further increased. The population size stood at 77 birds at the end of 2021.

Since 2007, the Northern rockhopper penguin EEP population has increased steadily thanks to an increasing annual hatch rate. The population size stood at 131 birds at the end of 2021 and is demographically stable.

The Eastern rockhopper penguin (*Eudyptes chrysocome filholi*) is only present at Marineland Antibes (France). It was therefore decided to establish a back-up-population at Pairi Daiza (Belgium) with eggs from Antibes. The population size stood at 30 birds at the end of 2021.

Set as a new style EEP, the population of the African penguin (*Spheniscus demersus*) stayed more or less the same with 2,184 individuals spread across 67 participant institutions.

In the new style EEP for the Humboldt penguin (*Spheniscus humboldti*), the population is stable with over 2,500 individuals in more than 90 institutions. Additionally, there is still a high demand for the species within EAZA.

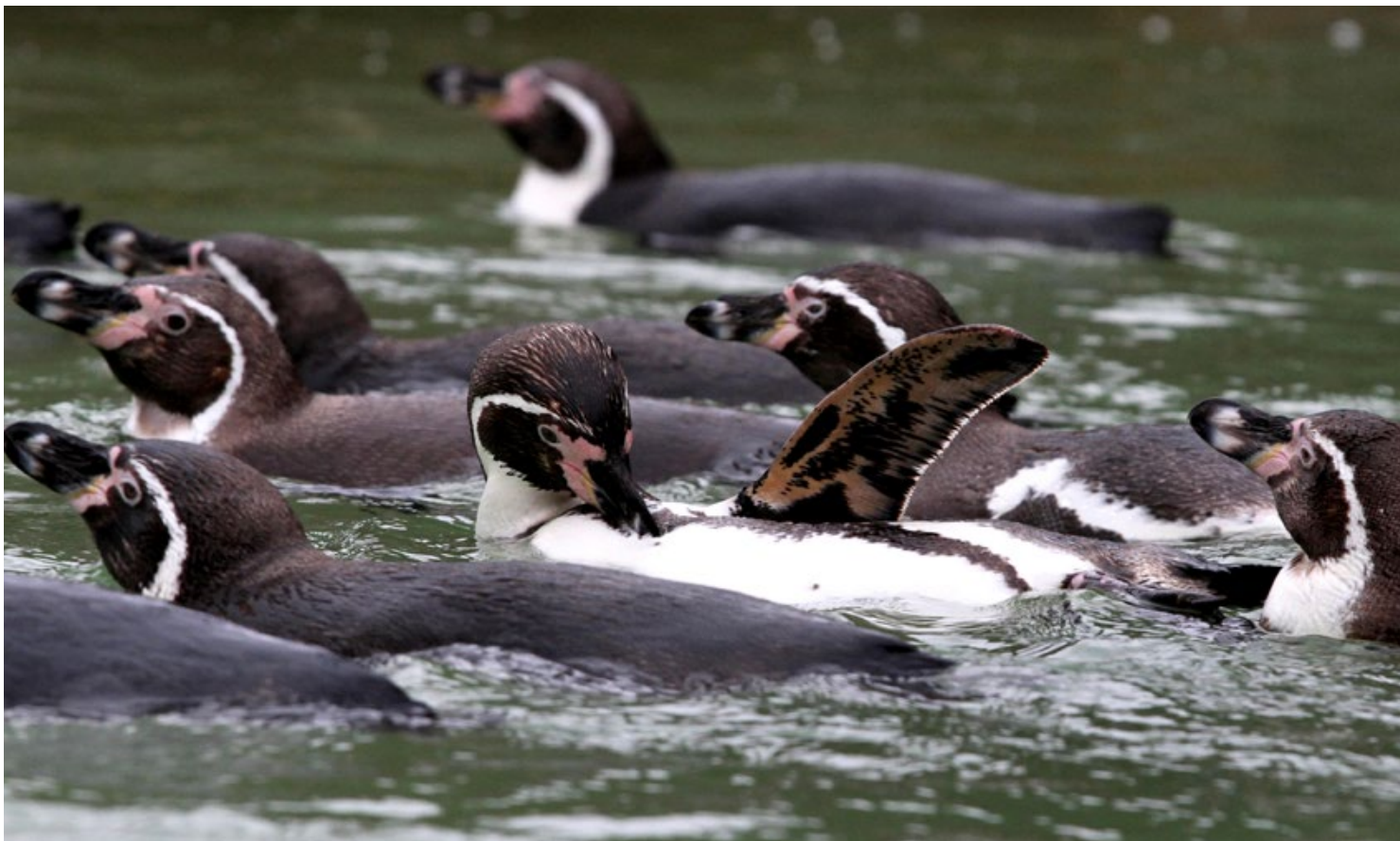
The Magellanic penguin was converted from a MON-P to a new style EEP as the TAG deemed the species was not competing for space with any other priority species, and there are likely sufficient numbers to maintain a sustainable population in the long term. The programme's size slightly grew in 2021.

As a result of the EAZA population management check-in in 2020, an LTMP was finalised for the new style Gentoo penguin EEP in 2021. The emphasis is on the taxonomy of the different sub-populations with the goals to re-evaluate management groups, phase out some lines in favour of others over time and to maintain the overall population size. The management groups are described as *Pygoscelis ellsworthi*, *P. papua* and *P. spp* (hybrids, unknowns, unclassified).

The new style EEP for the King penguin (*Aptenodytes patagonicus*) contained about 350 birds in 2021. The population has a high genetic potential. The LTMP established in 2021 aims to increase the population, equalise the sex ratio in breeding colonies, maintain bachelor colonies and encourage research.

In recognition of the concerns flagged by the IUCN Penguin Specialist Group (PSG) around worrying levels of trade of wild penguins, the Penguin TAG focuses on carefully managing what we have in our collections and discourages the acquisition of penguin species currently not in our collections (MON-T DNO).

In this context, both the Adélie penguin (*Pygoscelis adeliae*) and the Chinstrap penguin (*Pygoscelis antarctica*) have been recommended as MON-T phase out in the new RCP. The Galapagos penguin (*Spheniscus mediculus*) will be monitored by the TAG, as further discussion with the IUCN PSG is required. The little penguin (*Eudyptula minor*) is the only exemption given the individuals come from a carefully managed population in another region. In accordance with a space survey carried out by the Penguin TAG, ZAA might schedule a



Humboldt penguins (*Spheniscus humboldti*) © Zoo Neuwied

transfer of birds to EAZA in 2023, or possibly in 2022. The number of Macaroni penguins (*Eudyptes chrysolophus*) is still too low to form a sustainable population and is likely to continue decreasing due to aging and small colony sizes. So, the species will be MON-T but, the Penguin TAG agreed to attempt to continue with the species as it is a charismatic one.

The draft of the BPG for penguins will also be in further review in 2022.

CONSERVATION AND RESEARCH

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 conservation status of penguins, the threats to specific species and to penguins in general, the need to conserve penguins in the wild and 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).

Initiated by Sphenisco (Germany), the Penguin TAG took part in a call amongst EAZA to participate in a petition 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 ecosystem.

11 CICONIIFORMES AND PHOENICOPTERIFORMES

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

INTRODUCTION

Despite the effects of continued COVID-19 restrictions in 2021, much was accomplished in EAZA Ciconiiformes and Phoenicopteriformes TAG-related activities, some of which are mentioned below.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

A new (and new style) EEP for the Southern bald ibis (*Geronticus calvus*), a Vulnerable species according to the IUCN Red List, was initiated in 2021, with Emile Prins (GaiaZOO, the Netherlands) as Coordinator. Roman Horsky (Zlín-Lešná Zoo, Czechia) replaced Jo Gregson (Painnton Zoo, UK) as Studbook keeper for the Lesser adjutant (*Leptoptilos javanicus*), also listed as Vulnerable. Michal Podhrazsky (Zoo Dvůr Králové, Czechia) was appointed as Studbook keeper for the Goliath heron (*Ardea goliath*), the largest heron in the world and a model for management of more threatened herons.

ACHIEVEMENTS DURING THE YEAR

TAG meetings were held on 21 May and 22 September. Both included conservation-oriented presentations, some of which are mentioned below. The formation of a working group to determine the amount of space needed for flamingos in indoor enclosures was discussed, and several

meeting participants indicated a willingness to work on this. Preparations for the Ciconiiformes and Phoenicopteriformes RCP planning meeting, to be held in 2022, were initiated.

The TAG evaluated the participation of EAZA zoos in events showcasing International Flamingo Day (April 26) and interest of people in this day, and Paul Rose (Exeter College, UK) gave a talk about it at the TAG annual meeting. A section dedicated to International Flamingo Day can be found on the IUCN Species Survival Commission (SSC) Flamingo Specialist Group website (flamingo-sg.org).

COLLABORATIONS

Lucy Groves (Durrell Wildlife Conservation Trust, UK), the project officer of the White Stork Project in the UK (www.whitestorkproject.org) shared information about this project at the annual meeting. It is a collaboration between private landowners, and conservation organisations including UK EAZA Members Jersey Zoo and Cotswold Wildlife Park. Many of the white storks (*Ciconia ciconia*) in the programme originate from Poland, where Warsaw Zoo staff have worked hard to send 223 individuals from their own and other Polish rehabilitation centres to the UK since 2016, in addition to white storks sent to other translocation projects and zoos. The first successful reproduction of free-living white storks in the UK occurred in 2020, when four chicks fledged from two of three active nests. There were seven active nests in 2021, with 14 chicks fledging from six nests. Durrell oversees an intensive post-release monitoring programme using GPS tags. The TAG has worked together with Lucy to identify people in the IUCN SSC network to help locate GPS tags when it was clear that the stork wearing the tag was no longer moving.

CONSERVATION AND RESEARCH

Two research projects were initiated, including a mortality study of American flamingos (*Phoenicopeteris ruber*) in EAZA zoos, led by Amy Russon and Gabby Drake (Chester Zoo, UK). This has been on the TAG wish list for a long time and it is highly welcome! Additionally Arlin Slater (Cornwall College, UK) began a husbandry project for the saddlebill stork (*Ephippiorhynchus senegalensis*) in collaboration with the ESB Keeper Matthias Hendel (Dresden Zoo, Germany).



A pair of white storks (*Ciconia ciconia*) in their nest © Zagreb Zoo

The TAG Chair, Zlín-Lešná Zoo and Prague Zoo (Czechia) staff continued their logistical and expertise support for the Royal Society for Protection of Birds' (RSPN, Bhutan) conservation programme for the white-bellied heron (*Ardea insignis*). Three chicks, removed from a nest in the wild, were successfully reared in human care at the RSPN breeding centre, an important step for the conservation of this Critically Endangered heron. Centre staff personnel underwent training at Prague, Zlín-Lešná and Warsaw Zoos, and communications continued throughout the rearing of these three chicks.

Purnima Barman (Hargila Army, India) gave a talk during the TAG mid-year meeting about conservation of the Endangered greater adjutant stork (*Leptoptilos dubius*) in Assam, India. Many EAZA zoos have participated in financially supporting provision of artificial nest structures for this species, as discussed in the EAZA TAG Annual Report 2020. An article in the Autumn edition of Zooquaria 2021 explains how the Hargila Army, a grassroot women's conservation organisation, helped change this stork's fortune, and the TAG will continue to help in its conservation as well.

Hanneke de Boer (GaiaZOO) explained during the TAG annual meeting how the zoo managed to raise a large quantity of money for support of conservation activities for the lesser flamingo (*Phoeniconaias minor*) in South Africa through its greater flamingo (*Phoenicopterus roseus*) adoption scheme. This serves as a wonderful example of how zoos can raise such funds with iconic birds.

ADDITIONAL COMMENTS

The development and management of an extraordinarily large and impressive African Wetland Aviary at the Sigean African Reserve (France) was discussed by Antoine Joris at the TAG annual meeting. As increasingly more zoos are moving towards exhibiting birds in such enclosures such examples are important.

12 WATERFOWL AND PELECANIFORMES

TAG Chair: Johnpaul Houston (institutional support from Calviac Zoo, Calviac, France) • Vice Chairs: Bernd Marcordes (Cologne Zoo, Cologne, Germany), 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.



Dalmatian pelican (*Pelecanus crispus*) © Jonathan Beilby

The TAG met again in May at the EAZA Bird TAG mid-year meeting, and at the EAZA Annual Conference in September (both online).

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

During 2021 the TAG was delighted to welcome Glyn Young (Jersey Zoo, UK) as TAG second Vice Chair, which provides a strong link to the IUCN Threatened Waterfowl Specialist Group which is chaired by Glyn, as well as a long history with waterfowl, particularly the Madagascan programmes.

The ESBs for Scaly-sided merganser (*Mergus squamatus*), Baer's pochard (*Aythya baeri*) and White-winged duck (*Asarcornis scutulata*) were upgraded to new style EEPs. New programmes for Madagascar pochard (*Aythya innotata*), White-headed duck (*Oxyura leucocephala*), Seaduck group, Grebe group, and Madagascar teal (*Anas bernieri*) were approved. The new style EEP application for the White-fronted goose (*Anser erythropus*) was also submitted for approval.

Peter Smallbones (Wild Planet Trust, UK) will support the still vacant Baer's pochard EEP by helping to coordinate the production of BPG – which should be a big help for any willing new Coordinator.

ACHIEVEMENTS DURING THE YEAR

The TAG continued to explore the extent to which species included on the Invasive Alien Species (IAS) legislation are present in EAZA collections, and this will be worked on towards a research study during 2022.

COLLABORATIONS

Collaboration continued between East-Asian Australasian Flyways Partnership and both programmes for the Baer's pochard and scaly-sided merganser. Members of the TAG are also members of various IUCN SG Committees, such as the Threatened Waterfowl SG.

A report was provided on the structure and output of the Waterfowl and Pelecaniformes TAG for the upcoming International Wild Waterfowl Association (IWWA) yearbook, hopefully this will result in more collaboration between these parties.

CONSERVATION AND RESEARCH

The initial genetics work on scaly-sided merganser were completed by Joshua Wright (Manchester Metropolitan University, UK). It identified the means to test relatedness of the *ex situ* population and compare this to wild genetics, to ascertain if an import would be beneficial at this stage, and help make decisions on pairings. This will later form part of a larger study into historical loss of genetics in this species, and paternal inheritance.

Studies based on population data were completed for lesser white-fronted goose (*Anser erythropus*), Dalmatian (*Pelecanus crispus*) and pink-backed (*P. rufescens*) pelicans, and seaduck species, by Nottingham Trent University (UK) students, which will help to inform husbandry processes.

Work was started to research the formalisation of the marbled teal (*Marmaronetta angustirostris*) release project, to collaborate on a new release project with Naples Zoo (Italy) for white-headed duck (*Oxyura leucocephala*), and on some potential re-wilding projects in the Netherlands for Dalmatian pelicans. It is hoped that these can be presented in 2022.

ADDITIONAL COMMENTS

A report on the release of thirty-five more Madagascar pochard (*Aythya innotata*), through the project with Jersey Zoo, during 2021, was televised – highlighting the continued work in Madagascar.

Michelle O'Brien (Wildfowl and Wetlands Trust, UK) was confirmed as the Veterinary Advisor for the Grebe EEP, continuing the extent for her work with multiple TAG species.

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.



The Snowy owl EEP was accepted in 2021 © Annika Sorjonen / Helsinki Zoo

As COVID-19 was still an ongoing global pandemic, all in-person meetings during 2021 were cancelled and the work of the Raptor TAG carried on via e-mails and online meetings. Both the mid-year meeting and the one occurring during the EAZA Annual Conference were held online.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

The RCP for Owls was published at the beginning of 2021. The proposed EEPs were introduced during the online Annual Conference in October. The new style EEP for the Snowy owl (*Bubo scandiacus*) was approved in 2021 with Kirsi Pynnönen-Oudman as the EEP Coordinator.

The Vulture RCP workshop, held in June 2021, aimed to address all vulture species in one day, with in depth focus on Asian and African species. The four European vulture species were revised in 2019 in a LTMP, and these goals still stand. Many Coordinators participated in this online session together with *in situ* experts from all over the world. African, Asian and South American *in situ* experts shared their knowledge and discussed the need for *ex situ* conservation and breeding programmes.

In total, 23 species were revised.

- For the four European species, an EEP was confirmed/ established and direct conservation roles determined

- For the Asian vultures, it was decided to create an Asian vulture EEP that encompasses all five species even though only the red-headed vulture (*Sarcogyps calvus*) and Himalayan vulture (*Gyps himalayensis*) are kept within the EAZA community. This was decided to make sure the roles defined in the RCP are facilitated and to function as point of liaison with the SAVE initiative (Saving Asian Vultures from Extinction)
- For the seven African species, the existing EEPs for African white backed (*Gyps africanus*), White headed vulture (*Trigonoceps occipitalis*) and Rüppell's vulture (*Gyps rueppelli*) were confirmed. A new EEP for the Critically Endangered Hooded vulture (*Necrosyrtes monachus*) was recommended
- For the seven American species, the EEP for the Andean condor (*Vultur gryphus*) was maintained and the ESB for the King vulture (*Sarcoramphus papa*) was upgraded to a new style EEP. For the other species, it was agreed that they were managed well by AZA and as such are not a priority for EAZA but can play an educational role
- Three Least Concern vulture species (one African and two American) will be monitored by the TAG and two other Least Concern American vulture species will be monitored for phasing out

Discussions were held on the use of vultures in free flight demonstrations - which is not recommended for certain species but approved for others - and on the effects of cross fostering. The publication of BPGs for all species should be a priority task for the respective Coordinators. The need for the establishment of breeding centres for African vultures should be examined and the launching of an EAZA campaign on the African Vulture Crisis as such could help to emphasize the priority for conservation of these species.

In October, a one-day RCP workshop was held for the hawks, eagles and falcons. Given the focus of the TAG on European species and threatened species in human care, 19 species were selected for an individual assessment. This resulted in recommendations for EEPs for nine species: Secretary bird (*Sagittarius serpentarius*), Bateleur (*Terathopius ecaudatus*), Steller's sea eagle (*Haliaeetus pelagicus*), White-tailed sea eagle (*Haliaeetus albicilla*), Harpy eagle (*Harpia harpyia*), Imperial eagle (*Aquila heliaca*) and a combined EEP for Steppe (*Aquila nipalensis*) and Tawny (*A. rapax*) eagles. It was also decided to transfer the Lesser kestrel EEP, as only representative of the group of falcons, in a new style EEP.

Both subgroups are still processing the documents and hope to publish both RCPs in 2022-2023.

Effect of COVID-19 on breeding in human care and conservation work

COVID-19 circumstances in 2021 restricted transfers of young chicks for adoption by foster pairs. As such nest box protocols were developed and tried out for the bearded (*Gypaetus barbatus*) and cinereous (*Aegypius monachus*) vultures to avoid hand rearing: young chicks were raised in a "nesting box" in view of their parents, restricting human interventions to a minimum. Young bearded vultures raised with this method were successfully released. For the cinereous vulture, this method is still experimental and will be proved to work when

these young reach adult age, pair and breed successfully. In general, it is strongly recommended to use this methodology only when there is no other option.

The attempts to import Philippine eagle owls (*Bubo philippensis*) from the Philippines into Singapore Zoo (Singapore) are still pending, due to the sanitary restrictions.

Several EEP Coordinator positions, especially for the newly proposed EEPs, in the TAG are vacant, obviously due to the economical situation caused by the pandemic, which prevents zoos to take on any extra tasks for their staff. The TAG will continue looking for suitable candidates to establish the programmes.

CONSERVATION AND RESEARCH

The Annual Bearded Vulture Meeting 2021 gathered conservationists, researchers and enthusiasts in Dié (France) on 27-28 November 2021. The two-day in-person meeting included presentations on different research projects and showcased the excellent results of the breeding network and of different release projects. The second day focused on the problems of lead contamination and windfarms and ended on an introduction to Wildlife Crime Academy: a joint collaboration with the Junta de Andalusia and the Spanish Government that trains key stakeholders involved in vulture conservation in the Balkan region to fight effectively against wildlife crime in their respective countries.

COLLABORATIONS

The Animal Breeding and Genetics Group of Wageningen University & Research and Rotterdam Zoo (both the Netherlands) launched a partnership to work together on genomic studies, especially on the Rüppell's vulture EEP population, aiming for a better-informed management of the EEP.



Young bearded vulture (*Gypaetus barbatus*) born in human care
© Vulture Conservation Foundation

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), guinea fowl (*Numididae*) and chachalacas, guans, and curassows (*Cracidae*). Together with the AZA Galliformes TAG and the World Pheasant Association (UK), the TAG has been working to increase conservation efforts through the management of Studbooks, actively studying the birds in our care, as well as participating in and sharing knowledge with ongoing *in situ* projects.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

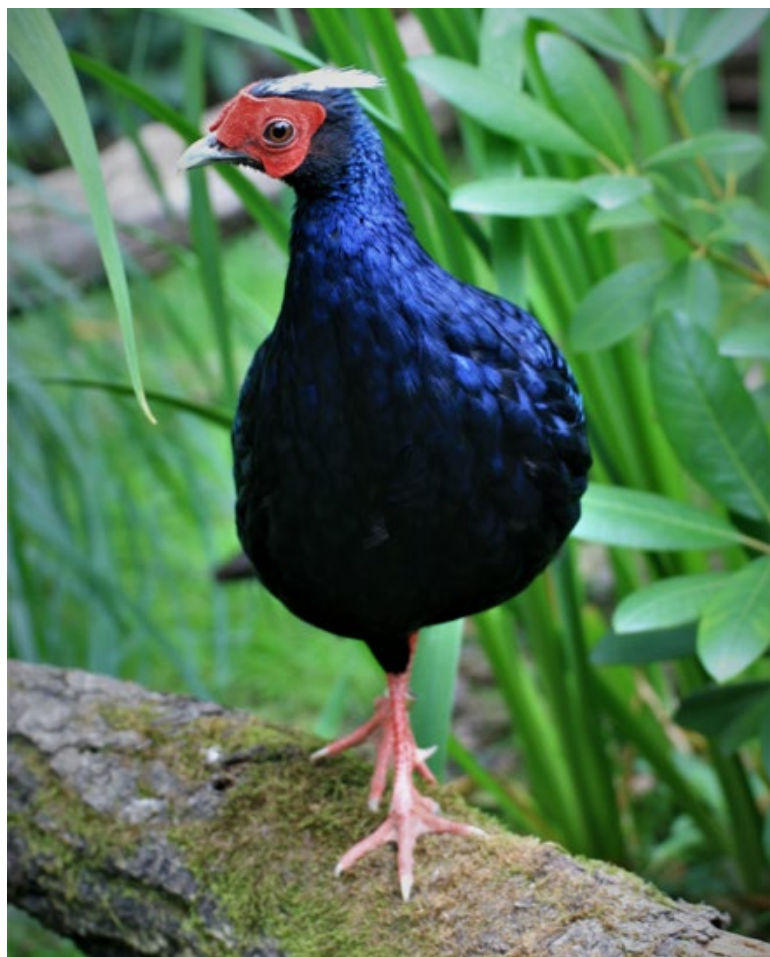
In an effort to revitalise the population of Malayan crestless fireback (*Lophura e. erythroptalma*) in Europe, a unique cooperation between Warsaw Zoo (Poland) and Batu Secret Zoo (Indonesia) was created. Warsaw Zoo sponsored breeding aviaries built on Batu Secret Zoo grounds for this species with the aim to bring back the progeny of this threatened species to set up an insurance population in Europe.

Alexander Pavlov (Moscow Zoo, Russia) was appointed as new Studbook keeper of the ESB for Great argus pheasant (*Argusianus argus*).

Due to a lack of a Species Survival Plan (SSP) Coordinator for Congo peafowl (*Afropavo congensis*) in AZA, Peter Galbusera (Antwerp Zoo, Belgium) stepped forward and is coordinating the SSP until a new candidate is found.

ACHIEVEMENTS DURING THE YEAR

TAG meetings were held during the online Bird TAG mid-year meeting and the online EAZA Annual Conference. Newly established working groups presented their plans. Rik Dams (World Pheasant Association), chairing the Cracid Working Group, showcased a number of cooperation opportunities for cracids. Ben Phalan (Parque Das Aves, Brazil) talked about active galliforme *in situ* conservation work focused on Bélem curassows (*Crax pinima*) and a highly threatened subspecies of the spot-winged wood-quail (*Odontophorus capueira plumbeicollis*). Luis Carlos (Mandai Nature Group, Singapore), chairing the Peacock Pheasant Working Group, presented a plan for the further development of this group, which will focus on the establishment of genus specific BPG, population management, research, *in situ* work and field surveys. Jo Gregson (World Pheasant Association), who will chair a Research-specific Working Group, gave an overview of research opportunities which could help *ex-* and *in situ* conservation work. Representing the Vietnam Pheasant Working Group, Simon Dowell (Chester Zoo, UK and IUCN/SSC Galliformes SG) gave an update on the progress of the Vietnam Pheasant Project.



Male Vietnam pheasant (*Lophura edwardsi*) © Hubert Fryca

COLLABORATIONS

The main focus of the Galliformes TAG remains the Vietnam pheasant (*Lophura edwardsi*). Thanks to the perseverance of our partner Viet Nature (Vietnam), the permits to build the first Vietnam pheasant conservation breeding and education centre are finally secured. Construction has started with the installation of a boundary fence around the available plot and will continue with the construction of staff housing and, once a project manager is appointed, the first sets of aviaries. This would not have been possible without the continued support from Karlsruhe Zoo, Berlin Zoo (both Germany), World Pheasant Association and Birdlife International (UK).

CONSERVATION AND RESEARCH

In 2021 the first blood samples were collected for a worldwide effort to sample all Vietnam pheasants within the International Studbook (ISB). Once enough samples are gathered, they will be analysed using next generation sequencing (double digest Restriction-site Associated DNA, ddRAD), which will create a fantastic tool to genetically manage our population. This data will allow to exclude any remaining hybrids from the Studbook. Additionally, museum samples will be tested, providing a better insight of what a healthy population of Vietnam pheasants should look like. Combined, this data would also help end the debate on the species' status of *Lophura hatinhensis* - which is still regarded as a separate species besides the Vietnam pheasant by some. When placed in a relatedness matrix the data will also provide the possibility

to create optimal breeding recommendations and select birds for *in situ* conservation translocations. This effort is in close cooperation with the EAZA Biobank, the Centre for Research and Conservation – established by the Royal Zoological Society of Antwerp (Belgium) - and San Diego Zoo Global (USA).

15 GRUIFORMES

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

INTRODUCTION

2021 has seen some positive progress within the EAZA Gruiformes TAG which is pleased to report that the vacant Chair and subsequent Vice Chair roles have been filled. Gary Ward (ZSL London Zoo, UK) was appointed as Chair after two years of standing as Vice Chair and Maximilian Birkendorf (Neuwied Zoo, Germany) was appointed as Vice Chair. They look forward to working with TAG members as the TAG continues to develop moving forward.

The Gruiformes TAG oversees all species in the order Gruiformes, including cranes (*Gruidae*), finfoots (*Heliornithidae*), limpkins (*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

We are currently looking for a new Coordinator for the Red-crowned crane EEP after Pavel Rozhkov (Moscow Zoo, Russia) stepped down from this role. The new Coordinator

will join the management team already established for this programme. Petr Suvorov (Brno Zoo, Czechia) was appointed as Vice Coordinator for the EEP and is doing a great job placing surplus birds and is assisted by his colleague, Oldřiška Kučerová, with the data management. We have also established a Red-crowned crane EEP Species Committee and are looking for colleagues to join and help with the management of this important programme. Please contact the TAG if you are interested.

Lauren Hough (Chester Zoo, UK) was appointed as ESB Coordinator for the West African crowned crane (*Balearica pavonina*) after the previous Coordinator Mike Woolham (formerly Banham Zoo, UK) stepped down due to other work commitments. The TAG wishes to thank Mike for his contribution. We look forward to working with Lauren who has had many years working hands on with this species at Chester Zoo.

Lauren will work closely with Ryan Barry (Longleat Safari Park, UK) who is currently monitoring the East African crowned crane (*Balearica regulorum*) as these closely related species share many of the same management needs and compete for space.

ACHIEVEMENTS DURING THE YEAR

A TAG meeting was held online in March with most of the TAG members present. It was a productive meeting where we discussed the way forward for the TAG and some of the common challenges faced by several of the programmes. One particular issue some of our crane programmes are dealing with is instances of EAZA Members acquiring programme managed species from outside the programme without prior consent from the EEP Coordinator. We will be tackling this by ensuring excellent communication from the programme Coordinators as we address institutional needs and reminding holders about EEP working procedures.



Sarus crane (*Antigone antigone*) © Neuwied Zoo

During the online EAZA Annual Conference in September, the TAG held a very successful session including updates from the EEPs for white-naped (*Grus vipio*) and Siberian (*Leucogeranus leucogeranus*) cranes and a monitoring report for sarus cranes (*Antigone antigone*). We also had species investigation presentations for common crane (*Grus grus*) and purple swamphen (*Porphyrio porphyrio*). In addition, we had an update from Mike Taylor, Chair of the AZA Gruiformes, Eurypygiformes, Cariamiformes and Otidiformes (GECO) TAG. It was very interesting to see how AZA has refined its RCP for species falling into this remit. The keynote speaker for the session was Otgontuya Batsuuri from the Wildlife Science and Conservation Centre of Mongolia who gave an interesting presentation on her research into migration routes of Siberian cranes in Mongolia.

COLLABORATIONS

Strong links have now been established with the AZA GECO TAG and the TAG Chair will be attending the Joint TAG Chairs meeting in California in April 2022.

CONSERVATION AND RESEARCH

The Gruiformes TAG is supporting a research project conducted by Taylor Keddie, AZA SSP Coordinator for Red-crowned cranes (*Grus japonensis*), to develop a mixed species document compiling the successes and failures for the species housed with red-crowned and other crane species of similar size and temperament. Once complete, the document will be shared with the EAZA Gruiformes TAG to hopefully increase the opportunities for housing crane species. Taylor is compiling data on red-crowned, white-naped, sarus, common, Siberian, wattled (*Bufo carunculatus*), hooded (*Grus monacha*), and black-necked (*Grus nigricollis*) cranes that were housed with any other animal species (successfully or unsuccessfully). If you hold any of these species and have not received the associated questionnaire, please contact the TAG so they can forward it to you.

16 CHARADRIIFORMES

No report was submitted by the EAZA Charadriiformes TAG for 2021.

17 PIGEON AND DOVE

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

INTRODUCTION

The most significant activity in 2021 for the EAZA Pigeon and Dove TAG was the RCP workshop that took place online over three days in July. The workshop was well attended by TAG members and external representatives. Another significant milestone was the formation of the IUCN Pigeon and Dove Specialist Group with several TAG members signing up to be members and serving committee members of this group.



Negros bleeding heart dove (*Gallicolumba keayi*) chick
© David Tan / Mandai Wildlife Group

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

The RCP workshop was conducted online with 25 participants attending across three days. A second draft of the workshop proceedings is currently with participants before submission to the EEP Committee in 2022. The workshop has recommended 14 new style EEPs along with the existing Santa Cruz ground dove (*Alopecoenas sanctaerucis*) EEP, that is already in place and was used as an example species. Once the RCP document has been approved by the EEP Committee, new EEP Coordinators will be required for these new programmes.

The Santa Cruz Ground Dove (SCGD) Working Group is finalising plans with the Solomon Islands government to allow the export of SCGD to EAZA zoos, thus supporting the expansion and sustainability of the EEP population that currently is being maintained at around 100 birds.

The Crowned pigeon EEP Coordinators, TAG Vet Advisor and TAG Vice Chair have continued to work on the BPG for the three crowned pigeon species (*Goura cristata*, *G. victoria* and *G. sclaterii*) and the first draft is planned to be available in 2022.

The *ex situ* Socorro dove (*Zenaida graysoni*) population is now globally at 157 birds with 90 in EAZA. Issues with skewed sex ratio (more males) and an ageing population are the main concerns for this EEP.

ACHIEVEMENTS DURING THE YEAR

See below: first export and breeding of Negros bleeding heart dove (*Gallicolumba keayi*) outside of the Philippines.

COLLABORATIONS

In 2021 the IUCN Pigeon and Dove Specialist Group was established with TAG members joining and also being actively involved in the group's Steering Committee. Two meetings were held in 2021 with discussion about the RCP process in EAZA and selection of species. This group has a wide selection of members but is still looking for members from

the Southern hemisphere. Trade in threatened *Columbiformes* is a concern for this group and will be discussed at the next Steering Committee meeting.

In September 2021, six Negros bleeding heart doves were transferred from the TALARAK Foundation (Philippines) to Jurong Bird Park (Mandai Wildlife Group, Singapore) as part of the first export of this species outside of its native range. This species along with other *Gallicolumba* will form part of a larger EEP once the RCP has been approved. This export was also successful in breeding the species, with squabs hatching in November. Congratulations to the team at Jurong for this achievement so quickly after the import! An interesting element of this was that one chick was successfully foster reared by a SCGD.

A devastating typhoon hit the Philippines in late 2021 causing severe damage to aviaries and the loss of some birds at the TALARAK breeding centre in Kabankalan. Several Critically Endangered Negros bleeding heart doves were lost during this storm and plans are in place to relocate from Kabankalan to Bacolod. Support from TAG members and the wider EAZA membership provided vital funds to assist with the ongoing issues.

CONSERVATION AND RESEARCH

The Socorro Dove Project (SDP) *in situ* team has again not been able to visit the Socorro island (Mexico) in 2021. The next trip is planned for the summer of 2022. Then, the work on habitat analysis as well as reforestation with endemic species of tree will (hopefully) continue. Juan Martínez' research team (Island Endemics Foundation, USA) has acquired and started to analyse satellite images to evaluate details of the recovery of the vegetation, with an emphasis on differentiating between natural and – potentially dangerous – invasive vegetation. To this end, the next trip is planned to collect (GPS based) data from the ground, for calibration is essential. In addition, the team will start an evaluation of the situation regarding the feral cat population. As reported earlier, there has been another team working on a cat eradication programme for many years. However, it has become clear that the goal has not been reached, although the reports issued have been talking about entering into the so-called “absence confirmation phase” since early 2017.

18 PARROT

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

INTRODUCTION

In 2021 the EAZA Parrot TAG initiated some fundamental changes including a change of Vice Chair and the publication of the virus management document. The latter caused some controversies and frustration amongst Members and will need more dialogue and collaboration within EAZA. Unfortunately, meetings continued to be disrupted by the ongoing COVID-19 pandemic.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

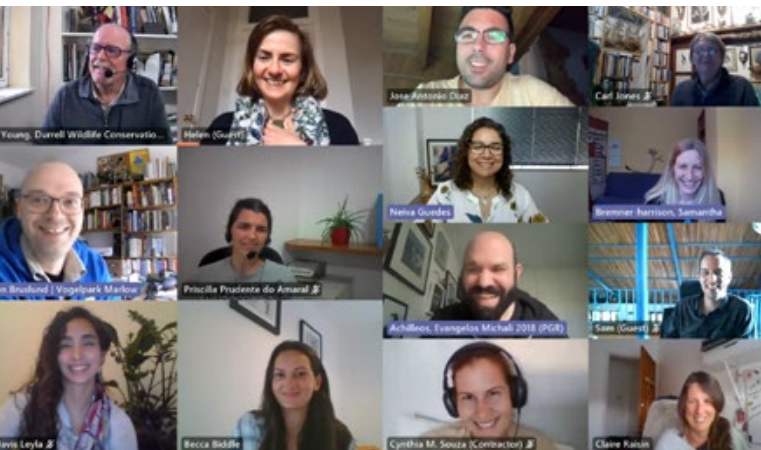
Sandra Molloy stepped down as TAG Vice Chair after moving on from her position at Dublin Zoo (Ireland) to pursue different challenges in the field of conservation research. Sandra played an essential and active role in the TAG leading on EEP evaluations, reports, protocol keeping and being a driving force in the development of BPG. She was also the first author of the “EAZA Reference Document - Virus Management for Parrots”. Sandra was the TAG Vice Chair from 2014 and Coordinator of two challenging EEPs: the Citron-crested (*Cacatua citrinocristata*) and Moluccan (*C. moluccensis*) cockatoos. For both she regularly submitted excellent annual reports and published Studbooks which can be found in the Parrot TAG workspace of the Member Area. Sandra was a patient mentor for many of the new EEP Coordinators in the TAG. Her experience, dedication and drive will be missed. We were very fortunate that Laure Pelletier from Beauval Zoo (France) stepped up to the call and challenge and was approved as the new TAG Vice Chair in October 2021.

Were also approved during 2021:

- Becca Biddle (Twycross Zoo, UK) as the new Coordinator of the Ecuadorian amazon EEP succeeding Mark Pilgrim (formerly Chester Zoo, UK)
- Csaba Harsányi (Sóstó Zoo, Hungary) as the new Coordinator of the White-crested cockatoo EEP succeeding the late Tobias Rahde (Berlin Zoo, Germany)
- Mark Rusli (Jurong Birdpark, Singapore) as the new Coordinator of the Moluccan cockatoo EEP succeeding Sandra Molloy (formerly Dublin Zoo, UK)
- Leah Williams (Chester Zoo, UK) as the new Coordinator of the Blue-throated macaw EEP succeeding Becca Biddle



African grey parrots (*Psittacus erithacus*) in a release aviary funded with support from EAZA Members © Limbe Wildlife Centre



Many participants joined the online conservation planning meeting on hyacinth macaws (*Anodorhynchus hyacinthinus*) © Evangelos Achilleos

ACHIEVEMENTS DURING THE YEAR

The “[EAZA Reference Document - Virus Management for Parrots](#)” was published as a BPG illustrating how to best manage the major viral infections of parrots. The suggestions primarily call for conservation breeding programmes and conservation translocation programmes to consider these principles and described methods, but individual institutions can also use them. One major conclusion of the document is that it is better for our parrot populations to make informed decisions. When information is limited, it is better to collect and share data rather than ignore a problem which continues to cause welfare issues amongst parrots in our care and that could jeopardize future conservation efforts.

COLLABORATIONS

The different cockatoo programmes are collaborating closely in a model initiated by the Parrot TAG where the different EEP Coordinators are, by default, part of the Species Committee of the other Cockatoo EEPs. Similar collaborations are being developed for macaws and amazon parrots as well.

The monitoring for Swift parrot (*Lathamus discolor*) continues to work closely with a private sector group formed to support this collaboration. The aim is to develop an EEP able to meet the goals of a larger population size. The Monitoring group - led by Sabrina Höft (Schwerin Zoo, Germany) - has authored husbandry guidelines in German which will form the basis of a future BPG.

The efforts for the World Parrot Day (31 May) to be a coordinated educational activity day in zoos around the world continued. Parrot TAG Education Advisor Stephan Worm (Serengeti-Park Hodenhagen, Germany) continued to collate and develop education material on parrot related topics which is freely available for download on our Parrot TAG website (www.parrotttag.org).

Several EAZA Members reached out to the Parrot TAG for advice, particularly on collection planning, construction details, conservation projects and virus management.

CONSERVATION AND RESEARCH

Together with Manchester University (UK), the TAG supported efforts to develop a non-toxic antiviral for field conservation

projects dedicated to the Endangered echo parakeet (*Alexandrinus eques*). Also of note was the new scientific name which resulted from a TAG supported research project, leading to the adoption of [new taxonomy within the former genus complex *Psittacula*](#) by BirdLife International and the IUCN.

Information provided by the TAG was used in the paper [Polly Wants a Genome: The Lack of Genetic Testing for Pet Parrot Species](#) by Henriëtte van der Zwan and Rencia van der Sluis (both North-West University, South Africa), with a list of parrot species and frequent colour mutations compiled by the TAG to be found in the supplementary material.

A presentation on the TAG and Parrot populations was held at the annual meeting of the German NGO Fonds für Bedrohte Papageien (Foundation for Threatened Parrots) which is associated with the Zoological Society for the Conservation of Species and Populations (ZGAP).

The TAG reviewed a Species Recovery Action Plan for the Critically Endangered ultramarine lorikeet (*Vini ultramarina*) in an ongoing collaboration with the BirdLife Partner in French Polynesia, Société d’Ornithologie de Polynésie (Manu SOP). Several members of the Parrot TAG and the Hyacinth macaw EEP participated in two online workshops organised by PhD student Evangelos Achilleos with Nottingham Trent University (UK) undertaking research in avian conservation with a focus on the hyacinth macaw (*Anodorhynchus hyacinthinus*). The key objective of his project was to determine the conservation impact of strategies currently employed for the species. The interesting and rewarding meetings had a good spread of species experts both from the field and zoos.

ADDITIONAL COMMENTS

An article on Virus management for Parrots can also be found in Zooquaria issue 111.

19 TOUCAN AND TURACO

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

INTRODUCTION

The EAZA Toucan and Turaco TAG was relaunched late 2021 and will now be managed under the umbrella of the EAZA Hornbill TAG for a period of three years. Additionally, it was announced that the Hornbill TAG will expand its taxonomic scope and cover all species of *Bucerotiformes*, thus also including hoopoes and woodhoopoes, two groups that were formerly included in the Toucan and Turaco TAG.

The new “interim” TAG Chairs launched the following action plan for the next three years:

- Develop a new solid structure, including subgroup leaders for relevant taxa and new leadership to be ready to continue managing the TAG in 2024
- Intensively discuss the future of species involved in this TAG;



Green aracari (*Pteroglossus viridis*) © Avifauna Birdpark

is there sufficient interest in (knowledge of) these birds and are there sufficient birds available (in Europe or elsewhere) or space in EAZA zoos to sustainably manage a selected number of species?

- Research the indirect and direct conservation needs in the taxa covered by this TAG. For instance, both red-billed (*Ramphastos tucanus*) and channel-billed (*Ramphastos vitellinus*) toucans are now considered Vulnerable, and the Fischer's turaco (*Tauraco fischeri*) is listed as Near-Threatened with perhaps only 1,500 to 7,000 birds left in the wild. On the other hand, turacos in EAZA collection may serve as ambassador species to generate support for the conservation of species such as Ruspoli's turaco (*Menelikornis ruspolii*) – Vulnerable and endemic to Ethiopia
- Consolidate existing and initiate new managed programmes and prepare for the development of a new RCP in 2023
- Appoint Veterinary and Education Advisors and stimulate research on species covered by the TAG
- Encourage the development of BPGs: several are already published, e.g. for turacos and red-crested turacos (*Tauraco erythrolophus*); others are in preparation, e.g. for bee-eaters
- Develop the TAG space on the EAZA Member Area and include historical Studbooks, monitoring reports, presentations, annual reports, research reports, conservation projects and BPGs
- Establish contacts and develop working relations with counterparts in AZA and other regions
- Analyse trade data and investigate role of EAZA zoos in international trade in taxa covered by the TAG, also in the framework of the EAZA21+ Campaign

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

Currently there are six ESBs managed by the Toucan and Turaco TAG:

- Red-crested turaco, managed by Arnaud Dazord (La Bourbansais Zoo, France)
- Fischer's turaco, managed by Gavin Harrison (Waddesdon Manor Aviary, UK)
- Violet turaco (*Musophaga violacea*), managed by Andrzej Kruszewicz and Marcin Chrapowicki (Warsaw Zoo, Poland)
- Channel-billed toucan, managed by Dijana Beneta (Zagreb Zoo, Croatia)
- Toco toucan (*Ramphastos toco*), managed by Nicky Watts (Paignton Zoo, UK)
- Red-billed toucan, managed by Mary Kantarelou (Attica Zoo, Greece)

Several other species/taxa are actively monitored.

ACHIEVEMENTS DURING THE YEAR

On 24 September 2021, the first TAG meeting to be conducted in several years took place during the online EAZA Annual Conference. The TAG Chairs introduced the TAG and miscellaneous related issues and other speakers made overviews of the species/taxa they monitor: rollers by Luke Forster (Blackpool Zoo, UK), roadrunners by Arun Idoe (Royal Burgers' Zoo, the Netherlands), toucans by Joost Lammers (Avifauna Birdpark, the Netherlands), red-billed toucan by Mary Kantarelou and Anna Kazazou (Attica Zoo), Fischer's turaco by Gavin Harrison, and bee-eaters by Maarten Vis (Rotterdam Zoo, the Netherlands).

CONSERVATION AND RESEARCH

A Master's student from the programme Global Wildlife Health and Conservation at the University of Bristol (UK) prepared a research project on play behaviours in toucans in EAZA zoos, amongst others to investigate if this behaviour could be used as a welfare indicator.

20 HORNBILL

TAG Chair: Koen Brouwer (Attica Zoo, Athens, Greece)

• TAG Vice Chair: Joost Lammers (Avifauna Birdpark, Alphen aan den Rijn, the Netherlands)

INTRODUCTION

The EAZA Hornbill TAG hosted two open, online meetings in 2021, one was part of the Bird TAG mid-year meetings on 21 May, and the other was conducted during the EAZA Annual Conference on 24 September.

An internal, closed meeting was also held in May with all EEP Coordinators to discuss the changes in the structure of the TAG and in preparation of the annual meeting.

The EAZA Toucan and Turaco TAG was placed under the guidance of the Hornbill TAG for a period of three years. Furthermore, the Hornbill TAG will now cover all species of *Bucerotiformes*, thus also including hoopoes and woodhoopoes, two groups that were formerly included in the Toucan and Turaco TAG.

The Chair of the Hornbill TAG is a member of the Steering Committee of the IUCN Hornbill Specialist Group, and participated in their annual two-day meeting in September 2021. He was also invited to be a member of the IUCN/SSC Helmeted Hornbill Working Group.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

In 2021, Michael Merker (Halle Zoo, Germany) stepped down as Coordinator of the Von der Decken's hornbill EEP. He fulfilled the management of this complicated EEP with success and the TAG is grateful for his work over the past years. The TAG Chair stepped in as interim EEP Coordinator until a new Coordinator is appointed.

Several Species Committee meetings, e.g. for the northern ground hornbill (*Bucorvus abyssinicus*), black hornbill (*Anthracoceros malayanus*) and knobbed hornbill (*Rhyticeros cassidix*), were conducted online. Online meetings were one of the few benefits of the COVID-19 crisis, as they proved to be helpful in bringing Species Committees efficiently together for productive meetings, without any traveling costs.

ACHIEVEMENTS DURING THE YEAR

Several very interesting presentations were given at the Hornbill TAG meetings in 2021.

Andreia Pinto (Lourosa Birdpark, Portugal) showed an overview of the current black-casqued hornbill (*Ceratogymna atrata*) population in EAZA zoos. Only two zoos are currently breeding this species, now managed as an EEP and in need of new holders in the future.

Jan Dams (Antwerp Zoo, Belgium) talked about the breeding of Eurasian hoopoes (*Upupa epops*) at the zoo. There seems to be an increased interest in keeping this species, and hopefully it can be managed as an EEP in the near future.

Baptiste Chenet and Yann Raulet (Montpellier Zoo, France) presented *Assisted reproduction in Northern ground hornbills*. The importance of avoiding producing imprinted hand-reared birds was stressed here, with potential ways to avoid this. Also, more attention to egg management is important.

Anton Vaidl (Prague Zoo, Czechia) explained how they puppet-rear rhinoceros hornbills (*Buceros rhinoceros*) in Prague: a very successful breeding of this Vulnerable species over the past few years.

Václav Straub (Zlín-Lešná Zoo, Czechia) reported about the rather dramatic episode of rearing great hornbills (*Buceros bicornis*) in Zlín-Lešná, the only zoo currently breeding this species in the EAZA region.

Mark Rusli (Mandai Wildlife Reserve, Singapore), a new and very enthusiastic Coordinator working hard on improving the status of the Black hornbill EEP population updated the TAG members on his work.

Tobias Knauf-Witzens (Wilhelma Zoo, Germany) talked about diagnostic and therapeutic approaches for casque cancer (squamous cell carcinoma) in a great hornbill.

All presentations, as well as many other interesting documents, can be found on the Hornbill TAG section on the EAZA Member Area.

CONSERVATION

The co-Chair of the IUCN Hornbill Specialist Group attended the Species Committee meeting of the Northern ground hornbill and announced that a first preliminary study of the population started in Ghana. The researchers Selasi Dzitse, a Ghanaian PhD student and Shine Tetteh, a MPhil student, will work together with Mabula, on collecting data on the biology of the birds and undertaking a population census. EAZA



Great hornbill (*Buceros bicornis*) © Václav Straub / Zlín-Lešná Zoo

holders of this species contributed photos of birds between 0 and 5 years old to assist the African colleagues with correct age identification of hornbills encountered in the field. Very little is known on the status of the species in the wild and EAZA colleagues with projects in other African countries can also contribute to the conservation of these birds by reporting sightings. Financial support for the conservation work has been provided by Montpellier Zoo and other holders are also encouraged to help.

21 SONGBIRD

TAG Chair: David Jeggo (Cologne Zoo, Cologne, Germany)

Vice Chair: Simon Bruslund (Marlow Birdpark, Marlow, Germany)

INTRODUCTION

Due to the continuing pandemic, the EAZA Songbird TAG met online in 2021. Meetings were held twice during the Bird TAG mid-year meeting and during the EAZA Annual Conference in September.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

Four EEPs were approved in 2021, two for long-established programmes under the old style management and two completely new. Interestingly, the new programmes are the first approved for species not from Southeast Asia.

The first of these is an EEP for the Red-legged honeycreeper (*Cyanerpes cyaneus*) which has an extensive range in South America. Fortunately, it is not rare and is listed on the IUCN Red List as Least Concern. It is, however, a very attractive species and a welcome addition to any exhibit. The EEP Coordinator is Mischa Hiltbold from Basel Zoo (Switzerland).

The other new EEP is for the Red-billed chough (*Pyrrhocorax pyrrhocorax*) for which the distribution encompasses much of Europe and into the more northerly areas of Asia, where it is an inhabitant of mountainous and coastal regions. It is perhaps overdue for this species to become an EEP as EAZA institutions have been managing it for some time as a source of birds for reintroduction. David Woolcock from Paradise Park (UK) was approved as EEP Coordinator. This institution has been working to better understand the techniques required to reproduce this species successfully in human care. It enabled them to supply birds for a reintroduction programme in Jersey (UK), carried out jointly by Durrell Wildlife Conservation Trust, the National Trust of Jersey and the Jersey Government.

The EEP for the Blue-crowned laughingthrush (*Garrulax courtoisi*) is one of the previously existing programmes. A breeding programme in human care was set up after its remarkable rediscovery when it appeared in trade in 1988. It was first an ESB and became an EEP in 2015. This is the only songbird to be the subject of a Global Species Management Plan (GSMP) and therefore the EEP is now part of this global programme with *ex situ* populations also found in mainland China, Hong Kong and the USA. The species is endemic to



Red-billed chough (*Pyrrhocorax pyrrhocorax*)
© Durrell Wildlife Conservation Trust

China and listed by the IUCN as Critically Endangered, with a population in the wild of some 350 individuals. Laura Gardner (ZSL London Zoo, UK) continues as EEP Coordinator.

The remaining new EEP approved in 2021, and coordinated by Chris Green from Cotswold Wildlife Park (UK), is for the Omei Shan liocichla (*Liocichla omeiensis*) - also a Chinese endemic species. This species is found in Mount Omei and other nearby mountains. Its population is considered to be declining and it is currently listed by IUCN as Vulnerable.

COLLABORATIONS, CONSERVATION AND RESEARCH

In early 2021 a trip and subsequent report on the state of remaining forest habitat on Wangi-Wangi (Indonesia) was published on the EAZA Silent Forest website (silentforest.eu). This stirred concern about the safety of the endemic Wangi-Wangi white-eye (*Zosterop sp.*). Since then, the Prigen Conservation Breeding Ark (Indonesia), enabled through support from Silent Forest partners Zoological Society for the Conservation of Species and Populations (ZGAP) and Marlow Birdpark (both Germany), have recruited a field officer and have taken the issue up with the Wangi-Wangi Marine National Park authorities placing attention on the islands threatened terrestrial habitats.

Two new studies provided evidence towards the status of the Javan pied starling (*Gracupica jalla*) as being likely now Extinct in the Wild. These reports emphasised the role of unsustainable trade. The IUCN SSC Asian Songbird Trade Specialist Group (ASTSG) issued a press-release on the subject in collaboration with Silent Forest and BirdLife Asia and an article was prepared by BirdLife International with quotes from Silent Forest.

During the year, the Cikananga Conservation Breeding Centre (CCBC; Indonesia) completed its new block of aviaries and delivered regular updates including a final report concluding this instalment of Silent Forest financial support. The Silent Forest Group will continue to work closely with CCBC, with their reports being published on silentforest.eu. Further financial support is needed for various activities, including the Javan green magpie (*Cissa thalassina*) field project initiated in 2021 and the ongoing Arfah Memorial Fund for young Indonesian women working in conservation.

Ecosystems Impact (Indonesia) achieved and repeated the first successes in breeding shamas. The conservation breeding efforts for the near-extinct shama taxa from Simeulue and nearby Babi Island (*Kittacincla malabarica hypoliza* and *K.m. opisthocha*, respectively) is a joint effort currently supported by ASTSG, the Avian Evolution Lab of the National University of Singapore, Mandai Wildlife Reserves (both Singapore), Marlow Birdpark as well as the EAZA Silent Forest Group. Regular reports can be found on the Silent Forest website. Towards the end of the year a funding gap was rapidly closed thanks to the support of Copenhagen Zoo (Denmark).

In Kalimantan (Indonesia), the Wak Gatak Songbird Rescue Centre was completed and will start operating in 2022. A final report was posted on the Silent Forest website and new supporters are called for in 2022.

A new collaboration between Silent Forest and Monitor Conservation Research Society (MCRS) grew out of the joint effort on the Songbird Trade Report for CITES and the development of the Songbirds in Trade Database initiated last year between MCRS, Species360 Conservation Science Alliance and the Silent Forest Group. This resulted in the formation of the "Monitor Songbird Lab" which focuses on conservation research on songbirds but is not geographically limited to Asia.



Javan pied starling (*Gracupica jalla*) © Simon Bruslund

Outcomes of the 2021 collaborations include the successful Master's Thesis of Jacqueline Jürgens (Hamburg University, Germany) and two main publications:

- Jürgens, J. et al. (2021). *A standardized dataset for conservation prioritization of songbirds to support CITES*. Data in Brief, 36, 107093

- Bruslund, S. et al. (2021). *Online trade records of Grey-backed Myna may indicate poaching practices in Baluran NP, East Java, Indonesia*. BirdingASIA 35: 102-105

The Silent Forest Group continued to take steps to increase its remit to global songbird conservation issues, however with a continued focus on Asian Trade issues in close cooperation with the IUCN-SSC ASTSG.

The performance group Mirabelle Arts launched their "Silent Forest Circus" inspired by the EAZA Silent Forest Campaign. Details and videos can be viewed on the Silent Forest website.

ADDITIONAL COMMENTS

The TAG Chair and Vice Chair published an article in Zooquaria 112.

The Silent Forest Website included 15 news posts, 22 project updates as well as new project and programme sites during 2021.

The EAZA Silent Forest Group on Facebook had nearly 3,000 followers and published 189 posts in 2021, including a species campaign in World Sparrow Day on 20 March. The associated "World Songbirds (Passeriformes) - Research and Conservation" Facebook Group has 350 members and posts nearly daily.

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 focus of the year 2021 was on the final compilation of the RCP for the EAZA Monotreme and Marsupial TAG (M&M TAG), as well as on an international workshop about the latest knowledge of the Koala Retrovirus (KoRV) and its implications for the future management of the Koala EEP.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

An update on the TAG's programmes with key developments for 2021 can be found below:

- EEP for Tasmanian devil (*Sarcophilus harrisii*): Restocking of Copenhagen Zoo's population (Denmark) with animals from ZAA. Plans to establish other breeding situations in Europe aside from Copenhagen Zoo. The Population and Habitat Viability Assessment planned for 2021 was postponed due to COVID-19 restrictions
- EEP for Koala (*Phascolarctos cinereus*): Kerstin Ternes (Zoo Duisburg, Germany) was confirmed as the new EEP



Koala (*Phascolarctos cinereus*) © Achim Winkler

Coordinator with Volker Grün (Stuttgart Zoo, Germany) as Vice-Coordinator. Continued focus on KoRV with a three-day online international workshop dedicated to it with experts from Australia, America, Asia and Europe. Need for further imports from Australia to broaden the genetic base of the European koala population. Proposed shifting of koala ownership from San Diego Zoo (USA) to the Koala EEP. The BPG are to be published in 2022

- EEP for Common wombat (*Vombatus ursinus*): Oliver Mojecki (Zoo Duisburg) was confirmed as the new EEP Coordinator. Small population in European zoos with few breeding successes. Continued need for new animals. Possibility to obtain Tasmanian subspecies from Tasmanian zoos. Possible opportunity to obtain mainland subspecies from orphanages in Australia
- EEP for Brush-tailed bettong (*Bettongia penicillata*): Stable population in human care. Need for new holders. Breed and cull as possible management strategy. Model species for other *Bettongia* species
- EEP for Greater bilby (*Macrotis lagotis*): No animals presently available for EAZA zoos. Species declining in the wild
- ESB for Kowari (*Dasyuroides byrnie*): Small European population declining. New holders interested in keeping the species. Proposal to upgrade to EEP
- EEP for Goodfellow's tree kangaroo (*Dendrolagus goodfellowi*): Small population with limited breeding successes. Few founders. Flagship species for conservation in Papua New Guinea
- EEP for Yellow-footed rock wallaby (*Petrogale xanthopus xanthopus*): Need for new holders. Suitable species for mixed exhibits

- ESB for Swamp wallaby (*Wallabia bicolor*): William Kreijkes (AquaZoo Leeuwarden, the Netherlands) confirmed as new EEP Coordinator. Only 31% of pedigree known. Proposal to upgrade to EEP
- ESB for Tammar wallaby (*Macropus eugenii*): Proposal to discontinue the ESB for this species
- ESB for Red kangaroo (*Macropus rufus*): Large population. Problem of placing surplus animals. Proposal to upgrade to EEP
- ESB for Eastern grey kangaroo (*Macropus giganteus*) and MON-P for Western grey kangaroo (*Macropus fuliginosus*): Problem in placing surplus males. Proposal to upgrade both programmes to EEPs
- MON-P for Short-beaked echidna (*Tachyglossus aculeatus*): Occasional breeding successes in EAZA. Proposal for genetic studies in cooperation with ZAA. Proposal to upgrade to EEP
- MON-P for Eastern quoll (*Dasyurus viverrinus*): Small European population, but regular breeding successes. Proposal to upgrade to EEP

ACHIEVEMENTS DURING THE YEAR

Following the online RCP meeting at the end of 2020 gathering all members of the M&M TAG, as well as members of ZAA and the IUCN Specialist Groups, the RCP was put onto paper in 2021. The final version was forwarded to the EEP Committee for approval at the end of 2021.

As part of the online EAZA Annual Conference 2021, Flemming Nielsen (Copenhagen Zoo) and Matthias Papies (Berlin Tierpark, Germany) attended the EAZA TAG Chair meeting. During the Animal Sessions, Flemming Nielsen presented

the development of the TAG and its Population Management Programmes, while Kerstin Ternes provided an update on the KoRV and its impact on the European koala population. Kelly Lavooij - van Leeuwen (EEO, the Netherlands) reported on the development and the status of the M&M TAG RCP.

An agreement was made with all European koala holders to have all koalas, currently present in Europe or to be imported from Australia, tested for the deadly strains of the KoRV.

COLLABORATIONS

The M&M TAG continued to cooperate with the IUCN M&M SG and ZAA.

CONSERVATION AND RESEARCH

Koala holders with animals belonging to the San Diego Zoo stock continue to pay an annual contribution fee to support the koala conservation and research projects in Australia, coordinated by San Diego Zoo.

Research is ongoing in conjunction with the Leipzig Institute for Zoo and Wildlife Research in Berlin (IZW), the Robert Koch Institute in Hamburg (both 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 KoRV on the health status of the koala.

The Tree Kangaroo GSMP supports the Tenkile Conservation Alliance, which works for the conservation of the Tenkile tree kangaroo (*Dendrolagus scottae*) in Papua New Guinea.

23 PROSIMIAN

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

INTRODUCTION

The COVID-19 pandemic continued to have an impact on the work of the EAZA Prosimian TAG and individual EEPs. These impacts are seen, among others, in positive new approaches in communication and continued (less positive) challenges with the *in situ* conservation efforts. As a result of Brexit, the EEPs and individual zoos are confronted with tremendous difficulties to put transfer recommendations in practice.

2021 saw the arrival of another lemur species in EAZA zoos, namely the Coquerel's sifaka (*Propithecus coquereli*). They are symbolic for interregional collaboration to maintain sustainable *ex situ* populations and to increase support of *in situ* conservation activities for (not only) sifakas.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

The TAG met twice in an online format. The closed TAG meeting was intended - and succeeded - to keep up communication among the TAG members, to reveal issues with the individual EEPs and to facilitate the process of improvement. The open meeting during the EAZA Annual

Conference informed a wider audience with a variety of presentations. Thanks to the online format, Josia Razafindramanana from the Madagascan primate research and conservation organisation GERP participated and reported about the conservation work for sifakas, mongoose lemurs (*Eulemur mongoz*) and ruffed lemurs, as well as about the impact of the severe drought especially in the South of Madagascar, which is causing humanitarian catastrophes.

Online meetings also proved to be very effective to work on LTMPs. Over the year, LTMPs for the Northern galago (*Galago senegalensis*), aye aye (*Daubentonia madagascariensis*), Alaotra bamboo lemur (*Hapalemur alaotrensis*), blue-eyed black lemur (*Eulemur flavifrons*), Coquerel's sifaka and crowned sifaka (*Propithecus coronatus*) were finalised. The LTMP for mongoose lemurs was initiated. The process resulting in the LTMP must be regarded as a highly valuable tool to achieve the goals defined for the individual EEP.

Three new Coordinators were approved: Andreas Pauly (Tierpark Berlin, Germany) for the Coquerel's sifaka EEP, Laury Ohannessian (Lyon Zoo, France) for the Red ruffed lemur EEP and H el ene Birot (Mulhouse Zoo, France) for the Red-bellied lemur EEP.

Under a new format, the TAG evaluation process was started by asking the TAG Chairs, TAG members and the EEO about the quantity and foremost quality of the TAG's work and



Coquerel's sifakas (*Propithecus coquereli*) for the first time in European zoos © Andreas Pauly / Berlin Tierpark

achievements. Emphasis must be given to produce BPGs. The BPG for the mongoose lemurs were delivered as a draft by the end of the year and will be finalised in cooperation with the Mongoose lemur SSP.

ACHIEVEMENTS DURING THE YEAR

The arrival of four pairs of Coquerel's sifakas at Chester Zoo (UK), Cologne Zoo and Berlin Tierpark (both Germany) from the AZA SSP, after a preparation of six years is most remarkable in many aspects. Originally intended to support the SSP by transferring surplus animals to EAZA zoos, there is now an EEP for the Coquerel's sifaka as the species is listed as Critically Endangered according to the IUCN Red List. This EEP will work in close collaboration with the SSP in the way of an informal global *ex situ* programme, which will hopefully include *ex situ* facilities in Madagascar in the future. The defined roles for the EEP are among others: contribute to an insurance population *ex situ* globally, indirect *in situ* conservation by fundraising for Sifaka Conservation / Impact Madagascar, and gaining a broader husbandry experience with this taxon for the benefit of all sifakas and especially the Crowned sifaka EEP. The arrival of the Coquerel's sifakas found a wide interest in the media being the first animals of its kind to arrive in European zoos and being very charismatic ambassadors for the conservation needs and activities in Madagascar. The efforts of the EEP Coordinator, Berlin Tierpark and Duke Lemur Centre (USA) under the helm of AZA and EAZA TAGs, are noteworthy for making this transfer possible.

The excellent connection with the AZA Prosimian TAG and their SSPs and their willingness for cooperation will also allow to support the Mongoose lemur EEP with animals from the SSP to improve the bleak demographics of the EAZA population. As for sifakas, a transfer of animals is also of benefit for the SSP, as it allows some additional breeding for the population that is otherwise limited due to space capacities.

CONSERVATION AND RESEARCH

Travelling to Madagascar became possible again only towards the end of 2021. Therefore, the *in situ* conservation projects recommended by the TAG were limited, as the cooperation with *ex situ* facilities lacked some "in person support and guidance".

Weather appearances - likely due to climate change - have an impact on regions and some specific sites of conservation activities. The people especially in the South and Southwest of Madagascar suffer from permanent drought, and humanitarian help is essential. Although the focus of the activities and the support by the established conservation organisations and initiatives (e.g. AEECL, Helpsimus, Sifaka Conservation) should be evaluated, and maybe adapted due to developments and changes, the financial contributions by zoos must be maintained – now more so than ever.

Delphine Rouillet (Cotswold Wildlife Park, UK), on behalf of Helpsimus, visited the areas of activity to ensure the development of the onsite education facilities. Employment of villagers to help monitoring the animals and protect the rice fields from invading and destruction by the lemurs are further important projects to safeguard the largest populations of



Education and humanitarian support are essential basics for *in situ* conservation in Madagascar © Helpsimus

greater bamboo lemurs (*Hapalemur simus*). It was satisfying to see that the activities have been largely continued in absence of in-person guidance.

ADDITIONAL COMMENTS

In its fifth year, the Prosimian TAG Newsletter, edited by Florence Perroux (Zoo de la Palmyre, France), appeared twice. The newsletter reaches a wide audience - from curators and zookeepers to *in situ* conservationists and researchers - within and outside EAZA. The newsletters are available on the Prosimian TAG section of the EAZA Member Area. A review of experiences made with the newsletter was given at the TAG Chairs / EEP Coordinators online meeting during the EAZA Annual Conference.

The video created under the lead of Frantisek Pribrsky (Ostrava Zoo, Czechia), and with contributions of the Pygmy slow loris EEP, Ostrava Zoo and Jihlava Zoo (Czechia), is a remarkable communication tool. It informs about the conservation needs for slow lorises and for this purpose recommends a more intensified *ex situ* management of the taxon by establishing "off show breeding hubs". The video was pro-actively distributed and can reach a wider audience as it is provided with subtitles in different languages.

24 CALLITRICHID

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

INTRODUCTION

The EAZA Callitrichid TAG was very active during the year, however, all meetings were virtual. Two closed meetings were held, in April and June. An open meeting was held at the EAZA Annual Conference in September.

The TAG manages 17 EEPs and five monitored species.



Black lion tamarin (*Leontopithecus chrysopygus*) born at Jersey Zoo
© Dominic Wormell / Jersey Zoo

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

There were no changes in the composition of the TAG during the year.

A considerable amount of programme evaluation took place with check-in and LTMP sessions. The TAG is very grateful to the EAZA Population Management team, in particular to Maria Paula Balcázar-Vargas (EEO, the Netherlands), for providing the help and expertise for these. Amazingly, by the end of 2021, eight LTMPs had been completed and are available on the EAZA Member Area.

A training session, organised by Peter Galbusera (Antwerp Zoo, Belgium), was held in December to update all Coordinators on how best to sort out potential pairings using the available software. Most Studbooks have now migrated to ZIMS for Studbooks, but there is a hold-up with a few due to the social group management software not yet being available. It is hoped that it will be added by mid-2022, allowing all the remaining Studbooks to migrate.

The RCP is available on the TAG section of the EAZA Member Area, where you can also find a shortened summary document.

The hardest job was for the Coordinators whose programmes transitioned from ESBs to EEPs. Non-EAZA zoos either had to be excluded or join the EEPs. A joint Species Committee was formed for several species: red-bellied tamarin (*Saguinus labiatus*), red-handed tamarin (*Saguinus midas*), silvery marmoset (*Mico argentatus*) and Goeldi's monkey (*Callimico goeldii*). A Species Committee was formed for the pygmy marmoset (*Cebuella pygmae*).

Annual reports and several Studbooks were produced and are all available on the EAZA Member Area.

One exciting event at the end of the year was the birth of a the very rare black lion tamarin (*Leontopithecus chrysopygus*) at Jersey Zoo (UK). The youngster is being hand-reared with the intention of reintroducing it to the parents in early 2022.

ACHIEVEMENTS DURING THE YEAR

An article, entitled *Life Support*, was published in the spring edition of Zooquaria on supporting field projects, given the devastating effect that COVID-19 had on many operations. The TAG gave a presentation at the EAZA Annual Conference in September, during the session on 'Life After the Plan' on how the RCP was being implemented. The importance of linking the *ex situ* programmes with field programmes was emphasised.

A series of virtual talks was organised by Kelly-Anne Kelleher (Twycross Zoo, UK). Topics ranged from environmental enrichment, field conservation, to nutrition. The talks' links are all on the EAZA Member Area and can be (re)watched at any time.

Five editions of the Callitrichid e-news were produced. Many new videos on husbandry and conservation were added to the EAZA Member Area. The TAG Facebook page achieved an amazing 1.9 K members, much of this due to the popularity of the virtual talks.

The updates for the BPG were slightly delayed and the updated/revised version will now be ready in early 2022.

Despite the lack of in-person meetings, the TAG communication remained excellent and invigorating and all look forward to the year ahead.

CONSERVATION AND RESEARCH

Research publications and listings are on the TAG section on the EAZA Member Area under 'research' and are also reported in the TAG e-news.

The TAG continued to support eight species in field projects in Brazil and Colombia. The fundraising plan should now be finalised in 2022.

A grant from the Primate Society of Great Britain to support the work of Proyecto Tití (PT; Columbia) had been agreed in 2020 but delayed because of the pandemic. It became the Society's Conservation Cause for 2021. The funds will be used to purchase VHF transmitters and receivers for tracking animals in Los Tities de San Juan Forest Reserve. Some of the funds raised have been sent to PT with more to follow. An article was published in the newsletter Primate Eye and another is scheduled in 2022.

A sponsorship from the Browse Poster Donation was received through the Facebook page for the Mountain Marmoset Conservation Programme.

The online meeting in September allowed the TAG to have presentations directly from field projects and we were delighted to be joined by:

- Rosamira Guillen from Proyecto Tití dedicated to the cotton-top tamarin (*Saguinus oedipus*). They gave the good news that publications are underway on data collected, and that field studies were able to resume. Genetic work is now being carried out in Colombia from hair samples through the Biobank at Copenhagen Zoo (Denmark). A third population census is planned
- Rodrigo Carvalho from the Mountain Marmoset Conservation Programme (Brazil) dedicated to the buffy-tufted-ear (*Callithrix aurita*) and buffy-headed (*Callithrix flaviceps*) marmosets. He reported that conservation strategies were being planned for the two regions where the species occur. There are currently two pairs of buffy-tufted-ear marmosets in the conservation centre and sites for possible reintroduction are being examined
- Kristel de Vleeschouwer from the Bahian Lion Tamarin Conservation Initiative (Brazil) dedicated to the golden-headed lion tamarin (*Leontopithecus chrysomelas*). She summarised recent events in the project including the publication resulting from the planning workshop held in 2019. The vision is for a sustainable population of golden-headed lion tamarins in their natural habitat and is very much science-driven, stakeholder-inclusive and community-based

ADDITIONAL COMMENTS

In 2021, members of the TAG were involved in the following publications:

- Stevenson, M., Savage, A. and Guillen R. (2021). *PSGB Conservation Cause 2020-2021 – Proyecto Tití*. Primate Eye 134: 18-22
- Fry, B.M. et al. *After short interbirth intervals, captive callitrichine monkeys have higher infant mortality*. iScience 25: 1-10 [To be published in 2022]

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, except the tamarins and marmosets. Some species have small populations in human care, while there are over 2,000 squirrel monkeys managed in two large EEPs of around 1,000 individuals each. Some of the smaller programmes may be more difficult to manage than the larger ones, due to demographic problems or lack of interest from zoos.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

In 2021, the COVID-19 restrictions continued to make our work difficult. Nevertheless, there were no dramatic impacts on the managed populations. Brexit, and with it the difficulties of moving animals to and from the UK, was more of a hindering and delaying factor in some cases, especially when

it came to recommendations of moving animals across the border.

All 12 Studbooks were migrated to ZIMS which makes the work of the Programme Coordinators and the collaboration within the TAG substantially easier.

The EEP for White-faced saki monkey (*Pithecia pithecia*) published the first edition of BPG for this species. The TAG thanks and congratulates the authors for this achievement. More will follow soon, specifically the BPG for black howler monkey (*Alouatta caraya*) is scheduled to be published in 2022.

We were finally able to find a new EEP Coordinator for the Common squirrel monkey (*Saimiri sciureus*): Paola Dvihally (Parc des Mamelles Guadeloupe, France) was appointed in May 2021 and Jan Vermeer (Parc Animalier de Sainte-Croix, France) could hand over the programme after coordinating it for two years *ad interim*. Jan also decided to step down as TAG Chair (after a career change) and Adrian Baumeyer (Zoo Basel, Switzerland – former Vice Chair) was appointed TAG Chair in August by the EEP Committee.

Within the programmes, we are facing the same issues as many other EEPs, mainly with surplus animals, often male surplus and with that trying to find new holders. We hope to be able to address some of these challenges during the coming years.



Red titi (*Plecturocebus cupreus*), mother with offspring © Basel Zoo

ACHIEVEMENTS DURING THE YEAR

The smooth transition to a new TAG Chair was the biggest non-animal challenge the TAG faced this year. Along with it, the TAG started the process of finding new Vice Chairs and re-organising the inner workings. At the end of the year, we were able to suggest two Vice Chairs, Warner Jens (Apenheul, the Netherlands) and Steven van den Heuvel (Overloon Zoo, the Netherlands), and a proposal will be sent to the EEP Committee in early 2022.

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 has already led to genetically important exchanges in the past years.

CONSERVATION AND RESEARCH

The TAG is still looking for and evaluating good *in situ* conservation projects to add to the ones already endorsed, so that holders of these species know more easily which projects to support.

The established projects needed more support to deal with the complications imposed by COVID-19 restrictions. 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 insights into the genetic make-up of several EEP populations. Furthermore, various ethological studies are carried out in different institutions and with different species.

ADDITIONAL COMMENTS

The last few months of 2021 brought up a novel challenge in Basel, Switzerland. Animal rights groups managed to bring

a political initiative to the ballots, proposing that primates should get fundamental rights (comparable to humans). Basel Zoo and the TAG fought against this initiative with the support of several zoo associations, namely EAZA, Verband der Zoologischen Gärten e.V. (VdZ, Germany) and Zooschweiz. Voting will take place in February 2022.

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 Monkey TAG has continued to manage its 27 programmes throughout 2021, and wishes to express its thanks to all institutions for continuing their support during another difficult year. The TAG continues to struggle with the complications that Brexit has created, but has had some success with UK-Europe transfers.

The TAG continued to embrace the online world and held a virtual TAG meeting in February. The agenda included presentations from the TAG Conservation Advisor Sian Waters (Vice Chair of the IUCN SSC Primate SG Section for Human Primate Interactions) on *the IUCN PSG BPG for Responsible Images of Non-Human Primates*, as well as from TAG Vet Advisor Yedra Feltrer (Chester Zoo, UK) on post-mortem protocols and the export/import screening guidelines. A presentation by Thomas Gillespie (Emory University and Rollins School of Public Health, USA) discussed interesting research in Cercopithecines and COVID-19. Christian Matauschek from Chances for Nature (Germany) and Frank Momberg from Fauna & Flora International (UK) talked about the Popa langur (*Trachypithecus popa*). The CEO of Pan African Sanctuary Alliance (PASA, USA) gave a presentation on their work. From the TAG, Matt Hartley (Yorkshire Wildlife Park, UK) gave a presentation on guenon reproduction, and Luca Morino (Paris Zoo, France) updated participants on the baboon programme.

At the end of 2021 the Chair and Vice Chair managed to have an in-person meeting at Artis Zoo (the Netherlands).

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.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

2021 saw a change in ISB/EEP Coordinator for the Diana monkey (*Cercopithecus diana*) with Andrea Dempsey (Artis Zoo, the Netherlands) taking over from Donald Gow (Edinburgh Zoo, UK). The TAG thanks Donald for all his hard work with this EEP.



Woolly monkey (*Lagothrix lagothricha*) and Bolivian squirrel monkey (*Saimiri boliviensis boliviensis*) in a mixed species exhibit © Basel Zoo



Hanuman langurs (*Semnopithecus hector*) © Shelia Smith

An LTMP was also developed for the species at the end of 2021, with more planned for 2022.

The TAG recognises that managing an EEP can be time consuming, therefore we are grateful to Veronica Cowl (Chester Zoo, UK and EEO) who has been supporting Alexander Sliwa (Cologne Zoo, Germany) with the EEP for Lion-tailed macaque (*Macaca Silenus*).

ACHIEVEMENTS DURING THE YEAR

The TAG was pleased to be able to offer support to PASA to confiscate and rescue 25 wild-caught monkeys being illegally trafficked from the Democratic Republic of Congo. The monkeys were thankfully seized at the Zimbabwe border, and PASA with partners Jeunes Animaux Confisqués au Katanga (J.A.C.K) were able to intervene. Thanks to the support of the TAG, J.A.C.K were able to build a fantastic new enclosure for them at the sanctuary and safely rehome them all. Within the 25 primates were a number of guenons species and mangabeys. The conditions the animals were being smuggled in were truly shocking, thank you to all the TAG members that supported this mission.

COLLABORATIONS

We continued to collaborate with our colleagues in other regions and look forward to meeting in 2022 at the Joint TAG meeting in Long Beach (USA).

For a number of years the TAG has enjoyed a fruitful collaboration with PASA under the leadership of their CEO, Gregg Tully, who moved on from PASA in 2021. The TAG

welcomes the new CEO, Kelly O'Meara and looks forward to working together.

CONSERVATION AND RESEARCH

The TAG throughout 2021 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 holders of

- all mangabey species and rolaway monkeys (*Cercopithecus rolaway*) support WAPCA (West African Primate Conservation Action, Ghana, www.wapca.org)
- Sulawesi crested macaques (*Macaca nigra*) support the Selamatkan Yaki project (Indonesia, www.selamatkanyaki.ngo)
- Barbary macaques (*Macaca sylvanus*) support Barbary Macaque Awareness & Education Conservation (Morocco, www.barbarymacaque.org)
- Drills (*Mandrillus leucophaeus*) support Save The Drill (Germany, www.save-the-drill.org)

We also welcomed a new conservation partner for our mangabey holders – Limbe Wildlife Centre in Cameroon (www.limbewildlife.org).

ADDITIONAL COMMENTS

A number of mangabey holders celebrated Mangabey Awareness Day on 1 August, along with our conservation partner WAPCA, and in early May some macaque holders marked a whole week for the genus with [International Macaque Awareness Week](#).

Vice Chair Andrea Dempsey co-authored this article Fernández, D. et al. (2021). *The Current Status of the World's Primates: Mapping Threats to Understand Priorities for Primate Conservation*. *International Journal of Primatology*, 43: 15–39. The mangabey spp. EEP published a very nice article in *Zooquaria* 111.

27 GIBBON

TAG Chair: Brice Lefaux (Zoo Mulhouse, Mulhouse, France) • Vice Chair: Vacant

INTRODUCTION

The EAZA Gibbon TAG manages six EEPs for: the Siamang (*Symphalangus syndactylus*), two Crested gibbons (*Nomascus leucogenys* and *N. gabriellae*) and three Hylobates (*Hylobates moloch*, *H. pileatus* and *H. lar*). All of these species in the wild are threatened by deforestation and poaching. They are all listed as Endangered or Critically Endangered on the IUCN Red List. The Gibbon TAG is composed of the six EEP Coordinators, the TAG Chair, one Vet Advisor, one Research Advisor, one Communication Advisor and the Vice Chair of the Section Small Apes of the IUCN Primate SG making the liaison with *in situ* conservation. 2021 was mainly marked by difficulties and prolonged delay on animal transfers for some institutions due to COVID-19 and Brexit.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

After a very productive year in 2020, there were no specific changes in 2021. An online Gibbon TAG meeting was held during the EAZA Annual Conference which met a good success of attendance.

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.

As mentioned in the Annual Report 2020, gibbons, as apes, are sensitive to the SARS-Cov-2. Protection when performing medical training and cleaning procedures appeared essential. In 2021, the pandemic continued to impact zoos, by delaying transfers of animals and reducing support to *in situ* conservation.

CONSERVATION AND RESEARCH

In 2021, the Gibbon TAG developed a cooperation with the 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:

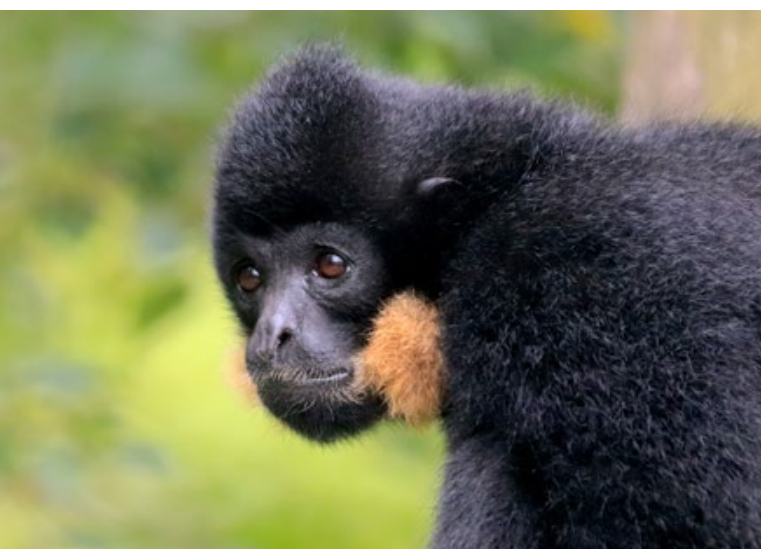
- Association Anoulak, Nakai Nam Theun National Park in Laos (www.conservationlaos.com)
- Endangered Primate Rescue Centre, Cuoc Phong National Park in Vietnam (www.eprc.asia)
- Angkor Centre for Conservation of Biodiversity, Cambodia (www.accb-cambodia.org)
- Cao Vit Gibbon Project, Flora and Fauna International, Vietnam (www.fauna-flora.org)
- Borneo Nature Foundation, Indonesia (www.borneonaturefoundation.org)
- Kon Ka Kinh and Kon Chu Rang, Vietnam, led by Frankfurt Zoological Society and Stiftung Artenschutz (<https://fzs.org>)
- Huro, India (www.facebook.com/HuroProgramme)

28 GREAT APE

TAG Chair: María Teresa Abelló (Barcelona Zoo, Barcelona, Spain) • Vice Chair: Sandra Reichler (Heidelberg Zoo, Heidelberg, Germany)

INTRODUCTION

The EAZA Great Ape TAG covers the following EEPs: Bornean and Sumatran orang-utans (*Pongo pygmaeus* and *P. abelii*), Western lowland gorillas (*Gorilla gorilla gorilla*), Chimpanzees (*Pan troglodytes verus* and *Pan t. troglodytes*) and Bonobos (*Pan paniscus*).



Male yellow-cheeked gibbon (*Nomascus gabriellae*)
© Heuze / Zoo Boissière du Doré



Bonobos (*Pan paniscus*) © Jeroen Stevens

Despite the persistence and evolution of the COVID-19, the TAG held an online mid-year meeting in April that was quite productive. An online meeting was furthermore held during the EAZA Annual Conference in September, which provided an update on all the matters of interest and captured the attention of many colleagues.

During the Annual Conference, the initiative “1 euro for *in situ* conservation” was explained. It was set up by some zoos allowing visitors to donate €1 when entering the zoo, which has proven to be a good way to get considerable extra funds for *in situ* conservation projects.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

After more than 40 years working as Coordinator for the Orang-utan EEP, Clemens Becker stepped down in preparation for his retirement from Karlsruhe Zoo (Germany). Former Vice Coordinator Simone Schehka (Münster Zoo, Germany) has taken over the Coordinator position from Clemens who will continue working for the EEP, now as Vice Coordinator, together with Neil Bemment (Barcelona Zoo, Spain).

Last year, three dedicated German colleagues retired after a long time working with great apes: Marianne Holtkötter (Wilhelma Zoo), Beatrix Köhler (Munich Zoo) and Gerd Nötzold

(Leipzig Zoo). The TAG acknowledges them sincerely for their collaboration during all the past years when the EEPs have professionalised so much and clearly defined their goals.

A new Species Committee was elected for the Gorilla EEP. This will likely renew the energy and enthusiasm for our work and lead to even more improvement of the EEP.

With regards to population numbers, at the end of 2021, the Bonobo EEP consisted of 144 (61.83) individuals at 11 institutions, the Chimpanzee EEP consisted of 782 (290.488.4) individuals at 94 institutions (the EEP is managed on a subspecies-level), the Western lowland gorilla EEP consisted of 476 (219.256.1) individuals in 74 institutions, the Bornean and Sumatran orang-utan EEPs consisted of 342 (68.97 Bornean / 63.96 Sumatran / 7.11 hybrids) individuals in 76 institutions.

ACHIEVEMENTS DURING THE YEAR

The Gorilla EEP Species Committee produced the Gorilla LTMP for the next five years with a wide view to the future, to the global conservation, and the communication and collaboration with other regions. Thanks to Elmar Fienieg and Nora Hausen (EEO, the Netherlands) for their invaluable help.

The Chimpanzee EEP finished their first BPG that will be published in early 2022. This document compiles the latest chimpanzee knowledge and will help institutions provide the best care possible for these animals.

At the end of the year, the TAG worked on the RCP for the great apes with a very good cooperation between the different EEPs looking altogether for the best interest of the four species. The RCP is expected to be finished during the first half of 2022.

The basis for the Bonobo LTMP was established and we hope to finish this during 2022.

A Conservation Education Working Group was newly established for the TAG in 2021. It aims to get the maximum advantages of the educative and awareness possibilities for conservation education.

The Welfare Group of the TAG was very productive in 2021. They developed their Terms of Reference; they analysed husbandry and keeper-attention surveys for several great ape species to assess the quality of care/attention provided by the keepers to great apes in different institutions, hours of observation, training, enrichment, etc.; and wrote an additional chapter about welfare for the BPG. Cooperation with other institutions and experts that are working with welfare science in great apes have been established. Furthermore, several welfare research topics were identified, and some projects initiated: e.g. medical training, gorilla castration development, and Tinder for orang-utans.

COLLABORATIONS

The TAG intensified communication and collaboration with organisations such as the Great Apes Survival Partnership (GRASP; Kenya) and the Pan African Sanctuary Alliance (PASA;

USA), and with other regions like the Southeast Asian Zoos and Aquariums Association (SEAZA), as we feel this is the basis to achieve a harmonised global conservation.

Together with SEAZA, the first Great Ape Husbandry and Health Workshop was organised by Taipei Zoo (Taiwan) thanks to Jim Kao (Taipei Zoo and SEAZA Orang-utans management programme Coordinator) and members of the EEO and the TAG. The online workshop was held on four days with the contribution of many appreciated colleagues, such as Amanda Embury (Zoos Victoria, Australia) and others from the Australasian Species Management Programme (ASMP), and AZA.

PASA colleagues presented their achievements during the TAG annual meeting. Some EAZA institutions supported and contributed to the *PASA Study on Reintroductions and Releases of African Primates*, and to the rescue of five chimpanzees in difficult conditions in Guinea Bissau.

Tanya Humle (University of Kent, UK) participated in the Great Ape annual meeting, and talked about the Western Chimpanzee (*Pan troglodytes verus*) Regional Action Plan.

CONSERVATION AND RESEARCH

During the annual meeting, the TAG informed holders about a new initiative of IUCN France for the conservation of great apes: the creation of a Great Ape Alliance or Network of local actors.

The TAG continues supporting the development of a Great Ape Cryopreservation Action Plan with close collaboration to the EAZA Biobank and the EAZA Reproductive Management Group.

The Great Ape Research Network was presented during the TAG annual meeting. It will help to improve the cooperation between zoos and research institutions. It has been developed by Kathrin Kopp (Max Planck Institute for Evolutionary Anthropology, Germany).

ADDITIONAL COMMENTS

The TAG supported the [IUCN Best Practice Guideline for Responsible Images of Non-human primates](#) and shared this document via different EAZA communication channels.

The following articles and posters were published in 2021:

- Bemment N. et al. (2021). *Long-term management plan for the Western lowland gorilla (Gorilla gorilla gorilla) EAZA Ex situ Programme (EEP)*. Apenheul Primate Park
- Jarvis, R. et al. (2021). *Assessing vitamin D status in zoo-housed great apes*. Poster for the EAZA Annual Conference
- Burrows, A., Liptovszky, M. and Self, I. (2021). *Physiological and anesthetic effects of hand injection versus darting to induce anesthesia in chimpanzees (Pan troglodytes)*. Journal of Zoo and Wildlife Medicine 52(2): 445–452
- Laméris, D. W. et al. (2021). *The influence of sex, rearing history, and personality on abnormal behaviour in zoo-housed bonobos (Pan paniscus)*. Applied Animal Behaviour Science 234: 105178

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 Pfliegerer (Leipzig Zoo, Leipzig, Germany), and David White (Chester Zoo, Chester, United Kingdom)

Despite the ongoing COVID-19 pandemic situation, the EAZA Small Mammal TAG maintained a constant effort to support and promote the conservation of small mammal species within our scope around the world: through management in human care, conservation education, engagement in *in situ* management and conservation programmes, and advocacy for these species both in human care and in the wild.

Each of six subgroups within the TAG have their own responsible person: the subgroup Afrosoricida, Macroscelidea, Tubulidentata and Hyracoidea (golden moles and tenrecs, elephant shrews, aardvarks, hyraxes) is managed by Richard Viduna (Jihlava Zoo, Czechia); the subgroup Pangolins and Xenarthra (sloths, anteaters, armadillos) is managed by Jutta Heuer (Halle Zoo, Germany); the subgroup Erinaceomorpha, Soricomorpha and Scandentia (hedgehogs, moles and shrews, treeshrews) is managed by Dijana Beneta (Zagreb Zoo, Croatia); the subgroup Hystricomorph rodents (cavies and porcupines) is managed by Dorota Gremlicová (Liberec Zoo, Czechia); the subgroup Lagomorphs, Myomorph, Sciuromorph, Anomaluomorph and Sciuravid rodents (mice and rats, squirrels, springhares, gundis) is managed by Johannes Pfliegerer (Leipzig Zoo, Germany); and the subgroup Bats is managed by David White (Chester Zoo, UK). TAG diversity is clearly advertised to everybody by our logo.

According to current taxonomy updates, gundis are considered to belong within Hystricomorph rodents now and their Studbooks were switched between our two rodent subgroups because of it.



Common gundis (*Ctenodactylus gundi*) at Aquazoo Düsseldorf
© Klaus Rudloff

A Sunda pangolin (*Manis javanica*) monitoring, including a Studbook, was established and Ade Kurniawan (Mandai Wildlife Reserve, Singapore) is responsible for this species. Ade's pangolin husbandry lecture was one of the highlights of the TAG annual meeting. BPG for the species have started to be prepared. A cooperation between Taipei Zoo (Taiwan) and Prague Zoo (Czechia) for the Chinese pangolin (*Manis tetradactyla*) was supported by the TAG. Hopefully, more new specimens will enlarge the European population by joining the group already held in Leipzig Zoo (Germany).

Unfortunately, most face-to-face meetings were cancelled again in 2021, or were held online with very limited content. The TAG mid-year meeting was cancelled, but one meeting was held during the online EAZA Annual Conference. The agenda included TAG updates by the Chair, an introduction to the new TAG liaison and EEO updates by Kelly Lavooij - van Leeuwen (EEO, the Netherlands). In addition to the Sunda pangolin talk by Ade Kurniawan, two-toed sloths housing and husbandry survey results were introduced by Lewis Rowden (ZSL, UK), and Southern three-banded armadillo (*Tolypeutes matacus*) ambient temperature and shell issues were explained by Dorota Gremlicová. The Vice Chairs and programme leaders also offered their overviews, generally well appreciated by the audience.

More online sessions were held during the year and important first steps were taken in preparation of the Small Mammal TAG RCP. Four workshops are planned for 2022 and 2023 in which the TAG members, together with other *in situ* and *ex situ* experts, will provide their skills and experiences to cover the large and diverse animal groups as well as possible.

The TAG regularly provided consultations on proposed taxonomic updates for different small mammal species for Species360 when it was required. They also helped EAZA Members with questions related to TAG species.

30 CANID AND HYAENID

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

INTRODUCTION

Like every TAG, the EAZA Canid and Hyaenid TAG continued to adapt to the challenges faced in 2021. With expert guidance from the EAZA Population Management Centre (PMC), the TAG continued to work towards the roles and goals identified in the RCP. The TAG has grown larger, with new members and Advisors, to help support the work of the EEP Coordinators. *In situ* conservation activity is still hampered by restrictions caused by the pandemic, but where possible collaborations continue and our *in situ* and *ex situ* research outputs have increased. The TAG newsletter resumed publication with support from ZSL (UK) and all our publications, resources and proceeding from conferences can be accessed through the Canid and Hyaenid TAG section on the EAZA Member Area.



Fennec foxes (*Vulpes zerda*) © Zoo Dvůr Králové

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

In 2021, There were some changes to the EEPs for Bush dog (*Speothos venaticus*) and Painted dog (*Lycaon pictus*), resulting in both EEPs having a more stable structure, with a lead Coordinator and a Vice Coordinator bringing even more expertise to the programmes and the TAG. The Bush dog EEP also appointed a new Species Committee and a Veterinary Advisor.

ACHIEVEMENTS DURING THE YEAR

Making full use of the online video platforms allowed the TAG and EEP Coordinators to participate in programme check-ins with the EAZA PMC. These were carried out for the bat-eared fox (*Otocyon megalotis*), Iberian wolf (*Canis lupus signatus*) and the maned wolf (*Chrysocyon brachyurus*). The video calls prepared the ground for a more in-depth assessment and the development of LTMPs. During 2021, we managed to carry out a LTMP meeting for the maned wolf which confirms or adjusts the *in situ* and *ex situ* roles of the species, originally developed in the RCP, as well as the goals for managing the population for the next five years. The TAG was also able to deliver an online meeting during the online EAZA Annual Conference, with presentations ranging from painted dog immune function research to husbandry and veterinary care for bush dogs as well as posters on pair bonding in wild canids.

COLLABORATIONS

We participated in a protocol trial for painted dog pup vaccinations in collaboration with Rosie Woodroffe from ZSL. The TAG continued to collaborate with the Institute for the Breeding of Rare and Endangered African Mammals (IBREAM) with research and *in situ* conservation projects. The Iberian wolf EEP is working with many partners, such as rescue centre and rewilding projects across their natural range to secure the continuing growth of the population. We are also connected with the IUCN Canid Specialist Group to develop standardised health protocols for the European grey wolf (*Canis lupus lupus*), painted dog, Ethiopian wolf (*Canis simensis*), kit fox (*Vulpes macrotis*) and Island fox (*Urocyon littoralis*).

CONSERVATION AND RESEARCH

The research outputs for the TAG's Research Advisors and the EEP Coordinators are always impressive, with several projects started or completed in 2021. Here are a few examples of the research undertaken during the year:

- Factors influencing survival rates in spotted hyena (*Crocuta crocuta*)
- Gap analysis of Canidae and Hyaenidae research
- Survey of grey wolf enclosure design
- Neurological disorders of polar canids (*Vulpes lagopus* and *Canis lupus*) in human care
- Neonatal mortality rates in canids in human care
- Review of feeding, husbandry, reproductive and medical management of maned wolves in zoos
- Morbidity and mortality of painted dogs in human care
- Resilient behaviours in captive and semi-free ranging populations of painted dogs
- PhD on Carnivore feeding methods in zoos

The EEP Coordinator for Dhole (*Cuon alpinus*) worked with *in situ* conservation partners throughout 2021 on progressing the previous work of the Population and Habitat Viability Assessment. The network was bolstered by the addition of ten new members, representing eight dhole range countries and helped develop range wide health capacity and response, distribution and identifying of sub-population and connectivity, methodology for estimate dhole abundance and evaluating human-dhole conflict.

ADDITIONAL COMMENTS

During 2021 our Education Advisor, supported by students, was working on and implementing the Canid and Hyaenid 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. These studies are vital to help us plan targeted education output for canids and hyaenids. We will be looking for more EAZA Members to contribute to this data in 2022 and will publish our findings. 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, particularly for the spotted hyena and striped hyena (*Hyaena hyaena*).

31 BEAR

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

INTRODUCTION

2021 was another year of working and meeting virtually for most members of the EAZA Bear TAG. Although we had a lot of productive online meetings and phone calls, we very much missed our face-to-face meetings. Hopefully in 2022 we will be able to meet again in person.

Our TAG activities and updates on all things bear-related are communicated on our Facebook page, which now has over 1,000 members.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

In March 2021, the Bear TAG RCP workshop was held online. It brought together experts from all over the world: Bear TAG members, but also a considerable number of representatives from the IUCN Bear Specialist Group, the AZA Bear TAG Chair, and experts working in the field. This made for some pretty committed, and sleepy, participants as they were joining us throughout the middle of their night.

The aims for this two-day workshop were to review and assess the conservation needs of bear species and identify any potential conservation roles for *ex situ* activities. We assessed the current status of regional (and global) bear *ex situ* populations and their relative viability and management needs. We also aimed to provide a framework for prioritisation of *ex situ* resources to support bear conservation. We wanted to create opportunities for communication and networking among professionals working with bears. And lastly, we aimed to promote the One Plan Approach to create an integrated conservation plan for bears by developing species-specific recommendations useful for strategic planning by the field conservation community and regional zoo associations.



Rewilding bears in Armenia © FPWC



The EAZA population of meerkats (*Suricata suricatta*) is proposed to be managed as an EEP © Robert Killips / Paradise Wildlife Park

like meerkats (*Suricata suricatta*) and invasive species need proactive management and is proposed to be managed under the EEP category. The small populations of non-threatened species are proposed to be phased out. The non-threatened species kept in other regional associations or nowhere are proposed to be in the “Do Not Obtain” category.

The other species are assessed based on their distribution range. Three regions are prioritised: Europe, Madagascar, and South-East Asia. The situation for nearly all Malagasy small carnivores is worrying, as well as for otters from South-East Asia, like the Asian short-clawed otter (*Aonyx cinereus*) and the smooth-coated otter (*Lutrogale perspicillata*), leading to the proposal of at least seven new EEPs, having direct and indirect conservation roles in range and within the EAZA community.

ACHIEVEMENTS DURING THE YEAR

Following the very efficient RCP workshop, the development of LTMPs is scheduled for the years to come for 26 species. The LTMP for the fossa (*Cryptoprocta ferox*) was published in December 2021. The ones for giant otter (*Pteronura brasiliensis*) and red panda (*Ailurus fulgens*) are in process.

The second edition of Best Practices Guidelines for red panda was published.

COLLABORATIONS

Various collaborative actions were undertaken in South-East Asia to support the conservation of different species.

The support of EAZA zoos to the Red Panda Network (RPN) in Nepal is growing. Janno Weerman (Rotterdam Zoo, the Netherlands), the GSMP convenor and Coordinator for the Red panda EEP, organises online meetings every three months with all regional Coordinators with discussions on research, conservation, ZIMS for Studbooks and intercontinental transfers.

More work is being done in collaboration with the IUCN SSC Otter Specialist Group (OSG) and in particular the Otters in Zoos taskforce through Jason Palmer (New Forest Wildlife Park, UK). The connection with some rescue facilities in South-East Asia dealing with the fallout from the illegal pet trade, including Save Vietnam’s Wildlife (Vietnam) and Cikananga (Indonesia), is getting stronger. One of the TAG’s goals for otter conservation is to ensure at least one good connection in each range country.

Finally, following the publication of the Conservation Strategy for Owston’s civet (*Chrotogale owstoni*) in 2019, the Owston’s civet EEP has developed a working plan to address potential husbandry and medical issues to maximise breeding success. It continues to collaborate with the EAZA Reproductive Management Group on hormonal analysis of civets in human care with the aim to identify oestrus and pregnancy.

Collaboration also occurs in South America. The Giant otter EEP and ISB Coordinator, Tim Schikora (Schwerin Zoo, Germany), together with the Latin American Zoo and

Aquarium Association (ALPZA), the Chico Mendes Institute for Biodiversity Conservation (ICMBio) - the Brazilian Ministry of the Environment's administrative arm - and the OSG advise and support the National Giant Otter Action Plan in Brazil.

CONSERVATION AND RESEARCH

Red panda conservation actions are carried out in cooperation with RPN, as detailed in the NGO annual report and showed in several publications listed at the end of this report.

Research on red panda microbiota and on the prevalence and pathological impact of Amdoparvovirus infection are ongoing.

Some work has been started with WildTrack and the footprint identification technology (FIT) system. Initially set up to identify individual cheetahs by their pugmarks, the system has now been expanded to try and quantify the information needed to track Asian otter species by their pugmarks. Paw pictures and measurements have been submitted to the FIT system.

Institutions further their work with Owston's civets through information exchange and funding for Save Vietnam's Wildlife. Shaldon Wildlife Trust, Newquay Zoo and Thrigby Hall Wildlife Gardens (all UK), three of the four EEP members won a BIAZA Animal Husbandry, Care and Breeding award for their collaborative approach in managing a small population and furthering our knowledge of the species.

The Giant otter EEP is currently considering participating in a reintroduction programme in Argentina (via Fundación Rewilding Argentina) with the OSG.

The planning of an International Giant Otter Workshop has resumed. The planning team - Tim Schikora, Sebastian di Martino (Fundación Rewilding Argentina), Carlos Galvis (ALPZA / Cali Zoo, Colombia) and Caroline Leuchtenberg (OSG) - is currently working on its organisation for 2022.

Furthermore, the TAG Research co-ordinators launched a large survey to evaluate the research needs that the TAG should encourage both *ex situ* and *in situ*.

ADDITIONAL COMMENTS

The TAG members were involved in the following publications:

- Harrington, L.A. et al. (2021). *Wild American mink (Neovison vison) may pose a COVID-19 threat*. *Frontiers in Ecology and the Environment*, 19(5): 266
- Bista, D. et al. (2021). *Improved trapping and handling of an arboreal, montane mammal: red panda Ailurus fulgens*. *Animals*, 11(4): 921
- Bista, D. et al. (2021). *Movement and dispersal of a habitat specialist in human-dominated landscapes: a case study of the red panda*. *Movement Ecology*, 9(1): 1-15
- Van De Bunte, W., Weerman, J. and Hof, A.R. (2021). *Potential effects of GPS collars on the behaviour of two red pandas (Ailurus fulgens) in Rotterdam Zoo*. *Plos one*, 16(6): e0252456
- Glatston, A.R. (2021). *Red panda: Biology and conservation of the first panda*. Academic Press
- Ahmad, A.A. et al. (2021). *Comparison of the effects of butorphanol-midazolam-medetomidine and butorphanol-*

azaperone-medetomidine in wild common palm civets (Paradoxurus musangus). *Veterinary Anaesthesia and Analgesia*, 48(3): 380-387

- Douay, G. et al. (2021). *Carpal ganglion cyst in an Asian small-clawed otter (Aonyx cinereus)*. *Journal of Exotic Pet Medicine*, 39: 76-77

- Douay, G. and Ramsay, E.C. (2021). *Captive red panda medicine*. *Red Panda: Biology and Conservation of the First Panda*, 245(245): 239

- Douay, G. et al. (2021). *Can a naturalistic diet affect the progression of nephroliths in Asian small-clawed otters (Aonyx cinereus)?* Joint AAZV/EAZWV Conference

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

2021 has been another productive period for the EAZA Felid TAG despite the lack of face-to-face meetings due to the ongoing impact of COVID-19. The mid-year meeting in March and the EAZA Annual Conference in September were well attended by TAG members and other interested colleagues, and allowed for the continuation of key discussions and presentations. Key outputs from these meetings were plans for a general BPG for big cat species, a survey to gather more precise data on felid conservation contributions by members, and a Felid Reintroduction Working Group within the TAG. Preparation of the January 2022 RCP meeting was done by the EEO together with the TAG Chairs.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

The new general BPG are in development and will help provide consistency in big cat species management.

The first LTMP for the UK population of wildcats (*Felis silvestris silvestris*) was completed. In addition to detailing actions for population sustainability, the plan also highlights the valuable support and contribution of the *ex situ* UK population to wildcat recovery efforts in Scotland. The TAG Chairs have also provided support and reviewed plans for a wildcat conservation breeding-for-release centre based at Highland Wildlife Park (UK), which supports these efforts.

Changes in the programmes include:

- Anne Rikke Winther Lassen (Randers Rainforest, Denmark) took over the Jaguar EEP Coordinator role from Becca Biddle (Chester Zoo, UK)
- The MON-P for Serval (*Leptailurus serval*) was taken over by Markus Patschke (Zoo Dortmund, Germany) from Leandra Poertner (Walter Zoo, Switzerland)
- Cecilia Tang (Singapore Zoo, Singapore) joined the Clouded leopard EEP as co-ordinator



Carpathian lynx (*Lynx lynx carpathicus*) mother, proven as pure by the subspecific purity test by the Senckenberg Research Institute (Germany), with offspring at Alpenzoo Innsbruck © André Stadler

ACHIEVEMENTS DURING THE YEAR

The TAG continued to communicate the Felid TAG Demonstration Guidelines completed in 2018 as guidance for improved educational displays and animal management. The TAG also supported various surveys to improve needs and objectives of its members to ensure ongoing activities are not only effective, but also address the key challenges. The pending results of a felid conservation support survey will allow the TAG to highlight the valuable role of its members in global conservation efforts.

The TAG continued to develop a strong partnership with the IUCN Cat SG that ensures *ex situ* and *in situ* activities are aligned and complimentary as much as possible. Some of the projects include developing a European strategy for Eurasian lynx (*Lynx lynx*) both *in situ* and *ex situ*, a backup strategy for Iberian lynx (*Lynx pardinus*) at EAZA zoos, wildcat breeding for release in Scotland, a range-wide strategy for the Persian leopard (*Panthera pardus saxicolor*), discussions about the role of *ex situ* populations of the north-central African lion (*Panthera leo leo*), and many others.

The TAG has also welcomed two new Veterinary Advisors, Simon Girling (Edinburgh Zoo, UK) and Anita Burkevica (Eskilstuna Zoo, Sweden), to ensure effective response and advice for veterinary issues.

COLLABORATIONS

Close collaborations from the TAG and individual programmes with felid researchers, conservationists and specialists allow the members to stay connected to *in situ* activities and further the input to conservation action. The TAG continued to discuss, review and advise on existing / potential felid

reintroduction projects in close collaboration with the IUCN Cat SG Chairs to ensure the EAZA populations can, where necessary, play a vital role in species recovery.

CONSERVATION AND RESEARCH

The Felid Gamete Rescue Project (coordinated by Leibniz Institute for Zoo and Wildlife Research, IZW, Germany) remains a key support tool to the TAG for maintaining a gamete bank for several species.

Several programmes and their members, including, but not limited to the Amur tiger (*Panthera tigris altaica*), Amur leopard (*Panthera pardus orientalis*), Persian leopard, Asiatic cheetah (*Acinonyx jubatus venaticus*), Pallas's cat (*Otocolobus manul*), wildcat, Sri Lankan leopard (*Panthera pardus kotiya*), and snow leopard (*Panthera uncia*) contribute directly to the *in situ* conservation efforts of the species.

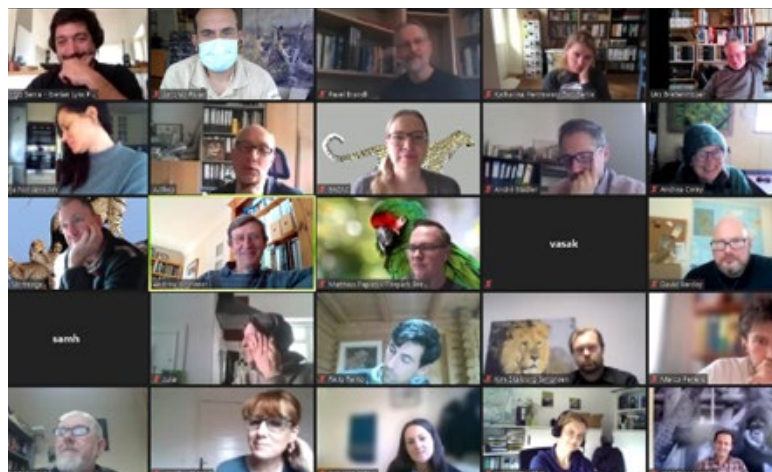
In situ field research projects for black-footed cat (*Felis nigripes*), led by the TAG Chair, and sand cat (*Felis margarita*), in particular, act as models for other small cat field research. Ongoing research with African lion (*Panthera leo*) taxonomy, led by Kim Skalborg Simonsen (Givskud Zoo, Denmark) supports critical decision making in relation to population management.

ADDITIONAL COMMENTS

During the 2021 EAZA Annual Conference, the TAG presented results of a "COVID-19 impact survey" from its members. They evidenced the challenges for Coordinators with time management, transfers, the negative impact of reduced networking / face-to-face meetings, and the need for effective solutions to solve these issues.

The Felid TAG continues to seek an Education Advisor to assist with key messaging, education development and awareness. A focus of this position is to support awareness, holding and management of small cat species, with many of the small cat programmes in need of new holders.

One presentation during the TAG mid-year meeting reviewed recent changes in IUCN Red List status. Most notable was the down-listing of Pallas's cat from Near Threatened to Least Concern.



Many participants joined the Iberian lynx (*Lynx pardinus*) presentation during the 2021 Felid TAG online mid-year meeting © Alexander Sliwa

34 MARINE MAMMAL

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

INTRODUCTION

The EAZA Marine Mammal TAG oversees the running of four EEPs for the Bottlenose dolphin (*Tursiops truncatus*), Caribbean manatee (*Trichechus manatus*) and Patagonian (*Otaria flavescens*) and Californian (*Zalophus californianus*) sea lions. The TAG also runs three ESBs for the South American fur seal (*Arctocephalus australis*), Grey seal (*Halichoerus grypus*) and Walrus (*Odobenus romarus*). There are MON-Ps for the South African fur seal (*Arctocephalus pusillus*) and Harbor seal (*Phoca vitulina*).

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 the European Association for Aquatic Mammals (EAAM)
- Adriane Prahl (Hagenbeck Zoo, Germany) for the Walrus ESB

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

The TAG continued working on all of the programmes and addressing the major challenges for the highest profile species.

The Marine Mammal RCP workshop took place online on 25-26 May and 1 July 2021.

Input was provided by Programme Coordinators, EAZA TAG members and external *in situ* and *ex situ* experts from the AZA Marine Mammal TAG, the IUCN SSC Cetacean Specialist Group's Integrated Conservation Planning for Cetaceans (ICPC), National Marine Mammal Foundation (USA) and Omacha Foundation (Colombia). The new RCP is expected to be published in 2022.

Thanks to 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

The collaboration with 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. The review of the Memorandum of Understanding between EAZA and EAAM has been postponed to 2022.



Caribbean manatee (*Trichechus manatus*) © Faunia / Ignacio Barrio

CONSERVATION AND RESEARCH

The conservation and research activities continued for the following projects:

- Rescue and Information Network (with EAAM support): rehabilitation, monitoring of Mediterranean monk seal (*Monachus monachus*) populations and participation in national and international fora
- Eastern Adriatic Monk seal project (partnership with Euronatur): monitoring activities in the Northern Ionian Islands (Greece)
- Mapping project: efforts to identify all suitable habitat of the Mediterranean monk seal in Greece, focusing on Crete, Cyclades and Pilio
- Participation in the monitoring of human activity (patrolling) in the National Marine Park of Alonissos, Northern Sporades (Greece)

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 (*Loxodonta africana*) and the Asian (*Elephas maximus*) elephants. The goal of the TAG is to develop and maintain a sustainable population of both species within EAZA institutions.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

In 2021 the African elephant EEP had 4.1 births, 1.6 deaths and transferred 6.1 elephants.

At the end of 2021 the programme covered 58.136 (194) elephants in 46 institutions.

Data analyses in preparation for the LTMP for African elephants were promising and showed that even though the species is still in a sensitive situation, the population level of 200 individuals can be kept long term if seven or eight births are achieved per year in the coming years. This is possible with the available breeding females and the good cooperation of the zoos in the EEP.

In the year 2021 the population of the Asian elephant EEP ended with 102.214 individuals. There were 6.1 births, 6.6 deaths, 0.1 transfer out of the EEP and 4.1 transfers within the EEP. The population thus slightly declined from the 322 individuals at the start of the year. The LTMP for the Asian elephant EEP is still in progress.

ACHIEVEMENTS DURING THE YEAR

Two TAG meetings took place during the year: a closed online meeting in September prior to the EAZA Annual Conference and an open online meeting during the conference.

An LTMP workshop for the African elephant EEP was held online in March 2021.



Asian elephant (*Elephas maximus*) taking a shower © Wilhelma Zoo

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

- Breeding options were provided for the groups in Basel Zoo (Switzerland) and Beekse Bergen (the Netherlands) by bringing in a new bull
- Establishment of new bachelor group with four males at different ages (6-20 years) in Győr Zoo (Hungary)
- Meetings with new institutions willing to take long-term bachelor groups
- Continued research on bull reproduction
- Initiating document from Howletts Wild Animal Park (UK) for their plan to transfer 13 zoo-born elephants to Africa
- Development of long-term masterplan in preparation of the new LTMP
- Online meetings with many facilities to discuss further steps with aim to structure the population into three main groups: breeding, bachelors, old female homes

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

- Start of a large-scale genomic research project assessing the genetic health of EEP and wild elephants, in collaboration with Wageningen University & Research (the Netherlands). First results expected in 2022

- Kharkov Zoo (Ukraine) and Łódź Zoo (Poland) were welcomed as EEP participants. Both have new, modern elephant facilities that will hopefully house multiple bulls together. For a sustainable future of the EEP, new insights in and experiences with keeping adult bulls together are dearly needed

COLLABORATIONS

Closer collaboration and exchange of data and experience occurred with the American African elephant SSP Coordinators.

The first online meeting was held with Ben Okita Ouma and Rob Slotow, both co-Chairs of the IUCN African Elephant SG (AfESG), to discuss collaboration opportunities.

The Asian elephant EEP collaborated with Elephant Haven European Elephant Sanctuary (EHEES, France) in the search for a good place for the single elephant left at the former Pont-Scorff Zoo (France). In October, it was safely transferred to the EHEES and is doing well. The TAG will continue this collaboration when it comes to finding good places for older, single female elephants.

CONSERVATION AND RESEARCH

Conservation and research projects of member institutions of the African elephant EEP:

Aalborg Zoo: Transfrontier Africa – Black Mamba Anti-Poaching Unit (South Africa); Basel Zoo/Beauval Zoo/ Beekse Bergen/Ouwehands Zoo/Wuppertal Zoo: Big Life Foundation (Kenya/Tanzania); West Midland Safari Park: Mali elephant project (Mali); Bojnice Zoo: Save elephants (Congo); Borås Zoo: Mara elephant project (Kenya); Zoo Dvůr Králové: Akagera Learning Centre (Rwanda) and Kelu honey organisation (Chad); Serengeti-Park Hodenhagen: Elephant Orphanage Project (Zambia); Opel-Zoo: Tawi Conservancy (Kenya); Ouwehands Zoo: Herpes research through the EEP; Wuppertal Zoo: International Elephant Foundation (IEF)

Also, the TAG collaborates with the IEF in the following conservation, awareness and scientific programmes that enhance the survival of elephants and protect their habitats in Africa:

Big Tusker Project, The Tsavo Conservation Area, Kenya; Conservation of elephants in key areas of Murchison Falls Conservation Area, Uganda; Elephant deterrent effectiveness in light of ecological and agricultural variation, Kenya; Elephant Utilization of the Zambezi-Chobe Floodplain Wildlife Dispersal Area, Zambia; Enabling human-elephant co-existence through applied research and stakeholder engagement, Botswana; Implementation of an Elephant Migration Corridor, Namibia; Elephant Monitoring and Conservation in Volcanoes National Park, Rwanda; Enabling human-elephant co-existence through applied research and stakeholder engagement, Botswana; Support to DNPW/CLZ K9 Unit Operations in Lower Zambezi, Zambia; Mount Kenya Horse Patrol Team, Kenya; Support to wildlife protection efforts in the Lower Zambezi National Park, Zambia; Sustaining local support for elephant conservation near Ruaha, Tanzania; The effect of community workshops and elephant movements on human-elephant conflict, Kenya; Using social network analysis to achieve faster conservation education outcomes, Uganda.

Some of the many *in situ* conservation organisations that get support from Asian elephant EEP institutions: Elephant orphanage in the Udawalawe National Park in Sri Lanka, Asian Nature Conservation Foundation, Biodiversity & Elephant Conservation Trust in Sri Lanka, and the Thailand Elephant Conservation Centre.

Veterinary Advisors

The Veterinary Advisors gave the following recommendations:

- Vaccination recommendations for EAZA elephants
- EAZA Elephant TAG guideline for GnRH vaccination in females

Upon request of the Asian elephant EEP Coordinator, the Vet Advisors discussed the possibility to use a Gonadotrophin Releasing Hormone (GnRH)-vaccine as a temporary contraception method. There is very limited experience with this drug in elephants, except for a few applications for permanently shutting down the oestrous cycle in old female elephants with tumours in the genital tract. In collaboration with the EAZA Elephant TAG Research Group guidelines were designed, including advice regarding dosage and frequency of administration and guidelines for monitoring the effects.

Two Vet Advisors supervised Anne Hess' (University of Veterinary Medicine Budapest, Hungary) Master's project "Lesions found in the post-mortem reports of the Asian and African elephants in EAZA" to-be-finished in 2022.

Other Vet Advisors gave presentations on the Elephant Health Day, held in Győr Zoo, with about 20 participants from Hungary, Romania and Austria.

Research Advisor Group

The Research Advisor Group compiled their Terms of Reference, established a platform for record keeping, and internal communication, appointed a Coordinator for the representation of their unified opinion and decisions. In collaboration with the Vet Advisors, they reviewed eight research proposals that were submitted via the Elephant TAG Research Application template.



African elephant (*Loxodonta africana*) herd in South Africa
© Thomas Kölpin

They designed a new template for the facilitation of data collection about ongoing and completed projects that were not submitted for TAG approval.

The group engaged in the LTMP, the development of the EAZA Elephant TAG guidelines for contraception in female elephants, and in the evaluation of research projects requesting financial contribution from the EEHV (Elephant Endotheliotropic Herpes Virus) Research Fund.

They also advised the TAG on research priorities, proposing a research project on birth problems in African elephants, and improved the TAG's access to research resources, via a third party hosted literature database.

ADDITIONAL COMMENTS

Cordula Galeffi (Zürich Zoo, Switzerland) and Stefanie Reska (Wilhelma Zoo, Germany) joined the TAG as second Vice Chair and Education Advisor, respectively.

These articles involved members of the TAG:

- Hoorweg, T.E. et al. (2021). *Elephant Endotheliotropic Herpes Virus is omnipresent in elephants in European zoos and an Asian elephant range country*. *Viruses*, 13(2): 283
- Jesus S.A. et al. (2021). *Assessing Coagulation Parameters in Healthy Asian Elephants (*Elephas maximus*) from European and Thai Populations*. *Animals*, 12: 361
- Lueders, I. and Stremme C. (2021). *Construction of a full mouth speculum facilitating oral examinations, bronchoscopy and gastric tubing in elephants*. *Tierärztliche Praxis Grosstiere Nutztiere DOI 10.1055/a-1624-4537*

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

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

Nick Karpov (Moscow Zoo, Russia) was appointed as the Coordinator of the newly established Kiang EEP (monitoring only).

Richard Østerballe (Givskud Zoo, Denmark), who monitored the EAZA population of maneless zebra, is now coordinating the newly established EEP for this species, assisted by Luboš Melichar (Liberec Zoo, Czechia).

The International Studbook for Asiatic wild asses was split into the individual species and they are now managed by the respective EEP Coordinators: Adriane Prah (Hagenbeck Zoo, Germany) for the Onager ISB; Anna Mekarska (Wrocław Zoo,



Kiang (*Equus kiang*) © Jaroslav Šimek

Poland) for the Kulan ISB and Nick Karpov (Moscow Zoo) for the Kiang ISB.

A new Species Committee was elected in January 2021 for the Onager EEP.

The newly established Species Committee of the Przewalski's horse EEP met online as well as the Working Group for Semi-reserves. Resulting from these, the Semi-reserve Advisory Group was established. The formalisation of EEP participation for established non-EAZA holders (Skandinavisk Dyrepark, Denmark) is ongoing.

The Maneless zebra EEP managed to obtain several animals from private owners in Poland. The Studbook has been cleaned and soon permanent numbers can be assigned to all individuals, including the recovered animals from Poland.

Several holders of Hartmann's mountain zebra have stopped holding this species but there is hope for new holders among newly interested zoos. This EEP is calling for new holders, especially for bachelors groups and for UK holders to minimise future UK/EU moves which encounter substantial delays and difficulties.

ACHIEVEMENTS DURING THE YEAR

All equid Studbooks have now been migrated to ZIMS for Studbooks.

COLLABORATIONS

The Equid TAG has agreed to support the University of Antwerp (Belgium) in their project: "Utilising multi-body static simulations to explore the macroevolutionary landscape of perissodactyl locomotion", by asking EEP zoos to provide equid limbs of deceased animals.

The Kulan EEP collaborates with Ben-Gurion University (Israel) who runs a project on developing genomic tools to analyse individual relatedness in the introduced population of Asiatic wild ass (*Equus hemionus*) in Negev.

CONSERVATION AND RESEARCH

The study "Genetic evaluation of the EEPs for wild Asiatic wild asses as a basis for future *in situ* and *ex situ* conservation strategies" led by Petra Kaczensky and Ralph Kuehn (Inland Norway University of Applied Sciences) continued in 2021 with EEP holders sampling their animals.

Monitoring of kulans in central Kazakhstan continued. Due to COVID-19 restrictions, no translocations occurred in 2021 but great news: the first kulan foal has been born in the central Kazakhstan steppe since 1930.

The following projects are ongoing in the Przewalski's horse EEP:

- Research on genetic background of horse infertility in cooperation with Munich Zoo and the Technical University of Munich (Germany)
- Feasibility study of possible reintroduction of Przewalski's horses in Eastern Mongolia in cooperation with National University of Mongolia, Mongolian University of Life Sciences and Charles University in Prague (Czechia)
- Ongoing support of Great Gobi B Strictly Protected Area reintroduction project (Prague Zoo, Czechia)
- Initial steps for establishment of the cooperation with governmental agencies in Kazakhstan with aim to reintroduce horses there in the future

Monitoring and research on Grevy's zebra populations is ongoing in remote areas of Kenya, as well as supplementary hay feeding during drought, and outreach programme to raise awareness of conservation issues in communities.

A group of representatives from the Union of Czech and Slovak Zoological Gardens visited the Kidepo Valley area (Uganda) and made an agreement with local authorities and conservationists to, hopefully, prevent importing Grant's zebras (*Equus quagga boehmi*) from Lake Mburo.

The Hartmann's mountain zebra and Grevy zebra EEPs are both contributing to research on stress hormone, metabolic hormone and reproductive hormone markers in equids in cooperation with Manchester University, UK. The aim of this project is to find a method to evaluate the health status of wild equids (and zebra in particular) *in situ*.

ADDITIONAL COMMENTS

A complete list of the 2021 publications can be found on the Equid TAG page in the EAZA Member Area. Here is a selection of them:

- Anoshin, R. et al. (2021). *Informational Collection of Zoos and Aquariums*. Moscow Zoo, Issue 40, Vol. 1
- Baptista, C.J., Sós, E. and de Carvalho, L.M. (2021). *Gastrointestinal Parasitism in Przewalski Horses (Equus ferus przewalskii)*. *Acta Parasitologica*, 1-7
- Langenhorst, T., Mate, L. and Naanyu, E. (2021). *Grevy's*

Zebra conservation in Kenya 2021 report and funding proposal prepared for supporters and members of the Grevy's zebra EEP conservation projects. Marwell Wildlife

- Wenker, C. et al. (2021). *Equine Sarcoids in captive wild equids: diagnostic and clinical management of 16 cases – a possible predisposition of the European cohort of Somali wild ass (Equus africanus somaliensis)?* *Journal of Zoo and Wildlife Medicine*, 52 (1)

37 RHINOCEROS

TAG Chair: Lars Versteeg (Safaripark 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.



White rhinoceroses (*Ceratotherium simum*) © Beekse Bergen / Mariska Vermij-van Dijk

2021 has proven to be a challenging year for all. Institutions being closed to the public, tourist income drying up at *in situ* partner institutions, as well as much pressure on continuing the conservation work *in situ* and with our rhino populations. On top of the COVID-19 pandemic, Brexit also had a huge negative impact as it basically stopped all exchanges between the EU and the UK. Luckily rhinos and rhino people are “thick skinned” and will most likely come back even stronger after this episode!

Friederike van Houwald (Basel Zoo, Switzerland), former TAG Chair, stepped down and was replaced by the former TAG Vice Chair, Lars Versteeg (Beekse Bergen, the Netherlands). The position of Vice Chair was advertised and filled by Katharina Herrmann, Conservation Officer from Berlin Zoo (Germany), which makes the TAG very happy.

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. Due to the successful trend - from 345 to 354 animals - the EEP has to become extremely creative. All participants are asked to create separation exhibits for potential surplus, and the EEP is pro-actively searching for additional holders. The balance between breeding (for health, behaviour and demographic reasons) and maximum capacity is tricky. Contraception is challenging in white rhinoceros, and one risks losing breeding animals for life.

Black rhinoceros (*Diceros bicornis*)

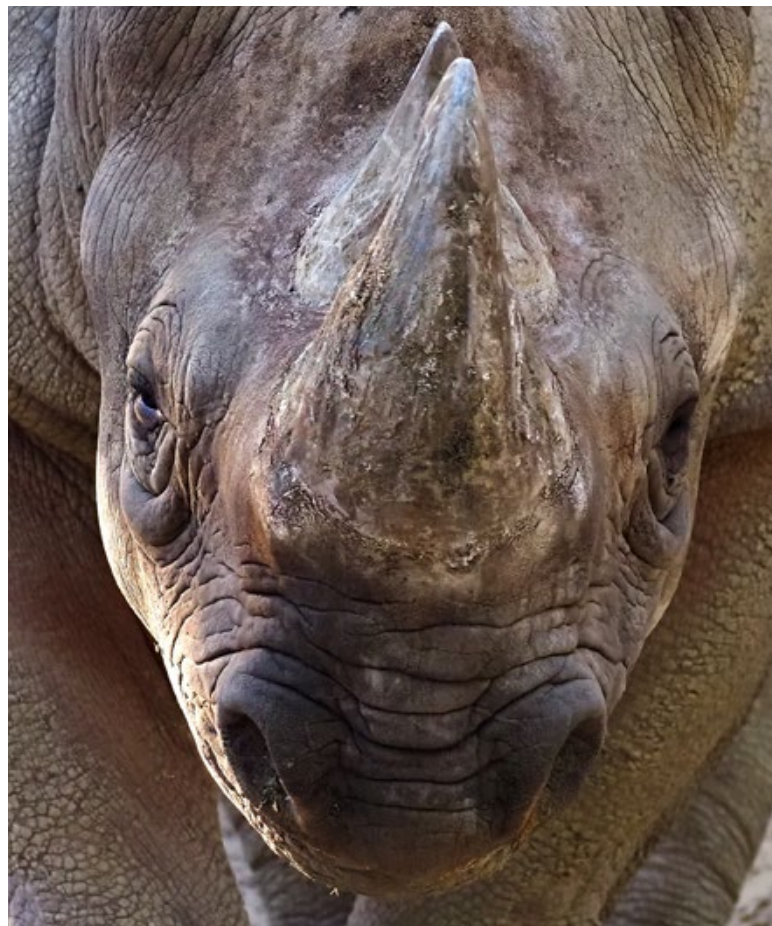
The vision and goal for the Black rhinoceros EEP are to:

- Ensure a healthy and sustainable EAZA population to fulfil the needs of EAZA zoos
- Manage the population to achieve a >5% growth rate per year
- Maintain 90% gene diversity from 41 founders for 100 years
- Work closely with the IUCN SSC African Rhino Specialist Groups (AfRSG) and governments to make Eastern black rhinoceros available for return to Africa to supplement populations where needed

A good development is the acceptance of two additional holders within the EEP.

Greater one-horned rhinoceros (*Rhinoceros unicornis*)

The population did not change much during 2021. The EEP issued a breeding stop which is still in place because it is nearly impossible to find new holders within the EAZA community. To improve this situation, cooperation with non-EAZA holders in Europe and South America was intensified and several ALPZA members joined the EEP. Transfers to this region prove difficult however, due to logistic and administrative problems. It is hoped that cooperation with other regions can be intensified, especially with the SSP to improve the narrow founder base.



Black rhinoceros (*Diceros bicornis*) © Eye to Eye Xperience / AudioVisual Xperience

ACHIEVEMENTS DURING THE YEAR

During the online EAZA Annual Conference a full meeting was organised with speakers from all over the globe, showing once again the dedication of the TAG towards global conservation cooperation.

COLLABORATIONS

Next to the cooperation with Save the Rhino International and the International Rhino Foundation, all three EEPs have strong collaborations all over the world.

CONSERVATION AND RESEARCH

The White rhinoceros EEP is continuously involved with research improving reproduction in connection with Body Conditioning Score, metabolism, social influences, etc.

The Black rhinoceros EEP is involved in several research projects, such as:

- A PhD thesis on the genetic makeup of the EEP population by Frankie Elsing (Manchester University, UK)
- Rhinoceromics project: risk of metabolic disorders particularly iron storage disease by the EEP Vet Advisors led by Linda van Sonsbeek (Rotterdam Zoo, the Netherlands)
- The effect of a zoo transfers on breeding success using ZIMS data, by Abbie Starsmeare (Reaseheath College, UK)
- An undergraduate project on age related pairing success using ZIMS data by Zoe Brown (Hartpury University, UK)

Doctoral candidate, Julia Aust (Zürich University, Switzerland) is carrying out a project aiming to record the *status quo* of greater one-horned rhinoceros husbandry in the EEP. It is part of a larger project including all three rhino EEPs. Julia will record details about enclosures, diets, medical status and body mass of EEP animals and study necropsy reports. She will also collect faecal samples and available blood samples for the TAG-supported Rhinoceromics project. The research started in 2020 but had to be interrupted due to COVID-19. It will continue again as soon as the situation permits to do so.

The TAG reviewed a proposal for the translocation of three Eastern black rhinoceros females from the EEP. This translocation would allow a genetic supplementation of the Grumeti population. A final decision on the project is expected in 2022.

ADDITIONAL COMMENTS

The Black rhino EEP finished the second edition of the [EAZA BPG for the species](#), with an updated Veterinary chapter.

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*), hippos (*Hippopotamidae*), pigs (*Suidae*), and peccaries (*Tayassuidae*).

Due to the global COVID-19 restrictions during most of 2021, the activities of the TAG were limited to those that could be conducted virtually.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

Following the virtual workshop taking place in November 2020, the new RCP was finalised in 2021. The EEPs started to prepare the first LTMPs. Several new style EEPs were already approved by the EEP Committee in 2021.

In 2021, Jan Pluháček (Ostrava Zoo, Czechia) became the new Vice Chair of the TAG, whilst Jörg Beckmann (Nuremberg Zoo, Germany) became the new TAG Chair, after Bengt Holst retired from Copenhagen Zoo (Denmark). Bengt chaired the TAG for 21 years. Therefore, it was decided he would become an Honorary Advisor to the TAG.

Maren Siebert took over the EEP for Chacoan peccary (*Catagonus wagneri*) from Christian Kern (both Berlin Tierpark, Germany). In addition, Diana Koch (Nuremberg Zoo, Germany) took over the EEP Coordinator role for Malayan tapir (*Tapirus indicus*) EEP from Jörg Beckmann.

ACHIEVEMENTS DURING THE YEAR

There was an online TAG meeting during the 2021 EAZA Annual Conference, but no mid-year meeting. All programmes continued their important work despite temporary lockdowns and other restrictions. The two new EEP Coordinators started working intensely on their programmes.

COLLABORATIONS

The TAG has a long-standing collaboration with the following IUCN SSC SGs: Tapir SG, Hippo SG, the Wild Pig SG and newly the Peccary SG. All these collaborations were continued and developed further during 2021 in the sense of the One Plan Approach.

In addition, all EEPs have close links to *in situ* projects for their respective species. Special cooperation is linked between the TAG and the IUCN SSC Newsletter Suiform Soundings. Ostrava Zoo also became an official partner of the IUCN Hippo SSC SG and helps to develop and to keep their new website updated (www.hipposg.org).

CONSERVATION AND RESEARCH

As in 2020, all conservation and research activities were impacted by the pandemic and had to follow local restrictions. For several projects, especially the *in situ* ones, that meant a temporary shutdown. Other projects continued at a smaller scale.

A new challenge for wild pigs, both *in* and *ex situ*, is the current spread of African Swine Fever across Asia and Europe. This disease is a real threat for endangered wild species and subspecies, as well as for our zoo populations. Therefore, the TAG is working together with several experts, especially from the IUCN SSC Wild Pig SG, European Association of Zoo and Wildlife Veterinarians, VZT (German Association of Zoo Veterinarians), Wildlife Conservation Society and the Friedrich-Loeffler-Institut (Germany) on a better understanding of the disease with the aim to develop an ASF vaccine, to save species from extinction, all in the sense of the One Plan Approach.

ADDITIONAL COMMENTS

As the new RCP for Tapirs and Suiform represents the key document for further steps of the TAG, we summarised the most important conclusions in the autumn 2021 issue of Zooquaria, freely available to all.



Malayan tapirs (*Tapirus indicus*) are managed as a new style EAZA Ex situ Programme © Jan Pluháček

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 identified new targets for the next two years and transitioned to new leadership. There has been some major progress with the European bison (*Bison bonasus*) and collaborative work with Indonesian partners on anoa (*Bubalus spp.*) and banteng (*Bos javanicus*).

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

Amy Humphreys (Chester Zoo, UK) has continued as interim Coordinator for the Banteng EEP, as the process of approval is completed. The first version of the EAZA Banteng BPG were further developed in 2021 and will be completed in 2022.

The TAG evaluation was completed this year with positive feedback from the TAG and EEO.

The European bison EEP continued to receive enquiries to hold the species both from EAZA Members and non EAZA institutions. Given the nature of the *ex situ* population of this high-profile European conservation icon, there has always been a more relaxed approach to the programme's relationship with non-EAZA collections. The Coordinator has also been approached about supplying more founder stock to existing reintroduced populations, e.g. in the Russian South Caucasus, and to aid in establishing new wild herds within parts of the species' historical range, e.g. the Chernobyl Exclusion Zone in Ukraine.

ACHIEVEMENTS DURING THE YEAR

This year saw the transition in Chair and Vice Chair roles to James Burton (Chester Zoo, UK) and Marcel Alaze (Münster Zoo, Germany), respectively. The whole TAG would like to acknowledge all the work that Terry Hornsey (Africa Alive!, UK) has contributed during his time as Vice Chair and then Chair of the TAG.

The TAG agreed to complete an interim review of the RCP within the next year. We also aim to complete two BPGs in the coming year and a further two in the year after. We have started the process to recruit an Education Advisor for the TAG.

The Coordinator for the European bison EEP contributed to the *European Bison (Bison bonasus) Strategic Species Status Review 2020*. This supports the European Bison Range-wide Conservation Action Plan of the IUCN SSC Bison Specialist Group.

COLLABORATIONS

The virtual TAG meeting at the EAZA Annual Conference saw representatives from the AZA and the tamaraw (*Bubalus mindorensis*), wild camel (*Camelus ferus*) and saola (*Pseudoryx nghetinhensis*) conservation community share their work. We hope this will encourage further collaboration in future years.

The third international awareness raising day for anoa and banteng GSMP involved a record number of 49 institutions. This 'Action Indonesia Day' was held on 19 August with a range of virtual and face-to-face visitor events and activities. See the corresponding [GSMP Annual Report 2021](#) for more details.

As mentioned in last year's Annual Report, European bison EEP Coordinator Douglas Richardson (Jersey Zoo, UK), Danny de Man (EEO, the Netherlands) and Katharina Herrmann (Tierpark Berlin and Berlin Zoo, Germany) continued to be part of the working group chaired by the IUCN SSC Bison Specialist Group that is looking to develop the next long-term conservation action plan for European bison. Also, the Memorandum of Understanding between World Wildlife Fund (WWF) Germany and EAZA to provide up to ten bison per year for ten years for reintroduction into the Shahdag National Park in Azerbaijan successfully completed its third full year.

CONSERVATION AND RESEARCH

Indeed, during November 2021, the latest group of European bison left Berlin Tierpark and Bern Zoo (Switzerland) for the Azerbaijan reintroduction project, in collaboration with WWF Germany and support from WWF Switzerland. Berlin Tierpark plays the most crucial role as the collection centre for most of the bison for the project, led by Florian Sicks. The other zoos that donated animals were Kolmården Zoo, Borås Zoo (both Sweden), Prague Zoo (Czechia), Cologne Zoo, Karlsruhe Zoo, Chemnitz Zoo and Bernburg Zoo (all Germany).

The Anoa EEP has initiated a study to determine the origin of individuals from European zoos and to characterise their genetic diversity, to improve future breeding recommendations.



Camera traps being set up in Alas Purwo National Park (Indonesia)
© Taman Nasional Alas Purwo

The TAG is collaborating with the Indonesian Zoo and Aquarium Association (PKBSI) to support genetic sampling of anoa, banteng and babirusa (*Babyrousa babyrussa*). This year PKBSI has successfully collected 53 samples from their institutions, which is more than 60% of all founders. Genetic experts from Copenhagen Zoo (Denmark) and Queen Mary's University (UK) are providing technical input. EAZA Members generously contributed funding for sample collection.

Population monitoring of banteng across the full extent of Alas Purwo National Park (Indonesia) was conducted for the first time by the park staff supported with funding from multiple EAZA Members.

TAG members were involved in the first steps of planning for Action Indonesia (anoa and banteng GSMPs) Phase III in 2022-2025. This will involve greater collaboration with Indonesian zoos in research, husbandry, population management expertise and awareness raising.

ADDITIONAL COMMENTS

The Anoa EEP has lost two genetically important females that died during pairing with a new male, which is a significant loss for the EEP. It is proposed that new guidelines for pairing are developed.

An article on banteng and anoa conservation was published in the WAZA newsletter and also featured as an IUCN Reverse the Red Case Study (www.reversethered.org).

40 DEER

TAG Chair: Noam Werner (Jerusalem Zoo, Jerusalem, Israel) • TAG Vice Chair: Christian Kern (Tierpark Berlin, Berlin, Germany)

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, 73 species fall under the remit of the Deer TAG (10 *Tragulidae*; 7 *Moschidae*; 56 *Cervidae*).

In 2021, the TAG held a meeting during the online EAZA Annual Conference. TAG members, including the TAG Chair, also attended the IUCN World Conservation Congress, which took place in September 2021.

During the year, the TAG Vice Chair, Christian Kern (Tierpark Berlin, Germany), stepped down from his role, and the TAG wishes to deeply thank him for his dedicated work and his efforts during his time in the position. The nomination of a new Vice Chair is in process and should be completed in early 2022.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENT

During 2021, the White-lipped deer EEP was established following the recommendation of the TAG's RCP. The



The EEP for Bactrian deer (*Cervus hanglu bactrianus*) is desperately looking for new holders © Noam Werner

programme was upgraded from an ESB to an EEP. Two more programmes are in different stages of approval or consideration by the EEP Committee, and another awaits further research before a decision can be made regarding its future.

Importing 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 veterinary law going into force in mid-2021, it is too early to judge whether the slight ease of restrictions would truly have an effect on the transfer of hoofstock into the EU.

Another EU regulation, the EU Invasive Alien Species Act (1143/2014), is also challenging. One species, the Reeves' muntjac (*Muntiacus reevesi*), has been included in the List of Invasive Alien Species of Union Concern, which means that its population in human care should be phased out. However, because the species is now listed as Vulnerable by conservation authorities in its native China, which resulted in the establishment of a new EEP for this species, the TAG has been collaborating with the EAZA EU Policy team in an attempt to gain support for an exemption from the Regulation for EAZA zoos, which will allow the TAG to manage the species.

During 2021, the axis deer (*Axis axis*) was suggested to be included in the List of Invasive Alien Species of Union Concern. The TAG had provided comments on the risk assessment that preceded the voting on the addition of the species. Also, according to the above mentioned Regulation, Member States can decide to include more species in their respective National Lists of Invasive Alien Species, and some have. For example, the sika deer (*Cervus nippon*) is now included in the national lists of four different Member States, which means that zoos in these countries officially need to phase out the species, including the Indochinese sika deer (*C. n. Pseudaxis*),

which is Extinct in the Wild and is an EEP species. 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 tracking 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 only been reported from very few animals, all wild or semi-domesticated, and only in Scandinavia. The EU is currently discussing possible measures to minimise the risk of the disease spreading, and while these measures could be strict, exemptions regarding transfers between zoo have already been included in the draft.

COLLABORATIONS, CONSERVATION AND RESEARCH

Cooperation with the IUCN SSC Deer Specialist Group (DSG) is ongoing. The TAG Chair, Noam Werner (Jerusalem Zoo, Israel), is also serving as a co-Chair of the DSG and several TAG members are also DSG members.

A collaboration between the DSG and the IUCN SSC Conservation Translocation SG is ongoing with the aim of writing Deer Conservation Translocation Guidelines and several TAG members will be asked to contribute to the writing of this document. The TAG member contribution is important as several TAG members, through the respective programmes they run or through their institutions, have 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.



Michie's tufted deer (*Elaphodus cephalophus michianus*) fawn at Tierpark Berlin © Noam Werner

Other collaborative work included providing expertise to the Central Zoo Authority of India regarding its *ex situ* and *in situ* conservation programme for the sangai (Manipur brown-antlered deer; *Rucervus eldii eldii*).

Several TAG members are also involved in research projects focusing on deer, including EEP species.

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 40 species (and about 80 taxa) held in EAZA zoos. Currently the TAG holds 11 EEPs and 11 ESBs - of which an impressive nine species are part of ISBs. The remaining species within the EAZA region are all monitored either by individual TAG members or subgroup leaders within the TAG.

Our mission: *To maintain healthy, genetically viable, self-sustaining, populations of okapis and a representative cross-section of antelope and giraffe taxa in human care. These populations will be: ambassadors, drawing attention to the plight of these taxa in the wild; a focus for fund-raising for conservation; a source of individuals for re-stocking and reintroduction purposes and a research resource to improve husbandry, welfare and in situ conservation.*

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

At this point in time, the AGTAG consist of a very stable group of people, and again this year, there were very few changes in Coordinators. Only the Scimitar-horned oryx EEP had to find a new Coordinator as Franck Haelewyn (Reynou Zoo, France) had to step down. We would like to thank Frank for his hard work. Please, check the AGTAG page on the EAZA Member Area to see the new Coordinator appointed in 2022.

Another change was, that the largest subgroup of the TAG, the Savannah Subgroup, is now led by two people. One of the TAG Vet Advisors Wouter Pieters now supports Catrin Hammer (both Görlitz Zoo, Germany) in managing this large group of animals. As always, we encourage to direct your enquiries directly to programme Coordinators. If that is not possible or there is no Coordinator for the species, we ask you to go directly to the relevant subgroup leader. You can always find an updated contact list on AGTAG page on the EAZA Member Area.

The Yellow-backed duiker MON-P has seen unusual progress this year. Through an effort from Sabrina Linn (Frankfurt Zoo, Germany), animals have been identified in AZA, and the first two of four animals have been transferred to Europe. When the last two arrive, the number of breeding pairs in EAZA will have gone from two to four. We hope that through intensive



Scimitar-horned oryx (*Oryx dammah*) in Dghoumes National Park, Tunisia © Marwell Wildlife

cooperation between the holders and with AZA the duikers will thrive in our region as mini antelope species are becoming increasingly scarce.

ACHIEVEMENTS DURING THE YEAR

The biggest task of 2021 for the TAG was the RCP workshop in November. As the TAG covers a large number of species, this process has been ongoing for several years. One of the major tasks was to decide on a list of species to be assessed. To help with that, we had several online meetings with, amongst others, the co-Chair of the IUCN SSC Antelope Specialist Group, David Mallon. He gave special insights in the current trends in the wild for the species we have, but also the species that we currently do not hold in EAZA, but might still need *ex situ* help. Other discussions considered the possibility of lumping similar species to save time and some were dedicated to molecular genetics considerations. All this input gave us a better understanding of every species and helped us follow the One Plan Approach and decide the best roles for each programme.

For the meeting itself, a total number of 36 people participated - most of them for the entire duration of three full days. The Chairs would like to thank all the participants for their efforts up to and during the meeting. Among the participants were EEO staff, Coordinators, and TAG Advisors for research, *in situ*, conservation, veterinary, education, etc. During the meeting, 49 species and subspecies of antelope and both species of giraffids were discussed. The final report should be available in 2022.

COLLABORATIONS

Even though physical meetings were not possible, the TAG held an online mid-year meeting in June with participants from both the *in situ*, conservation, and research world. The TAG has strong connections with the IUCN SSC Antelope SG and Giraffe and Okapi SG as well as close connections to several universities.

We also work closely together with the AZA Antelope, Cattle, Giraffid and Camelid TAG. During our mid-year meeting, the AZA TAG Chair, Steve Metzler, gave an insight into their RCP process and some of the problems and solutions they have encountered.

42 CAPRINAE

TAG Chairs: Pascal Damois (Parc Animalier d'Auvergne, Auvergne, France) - outgoing - and Dennis Müller (Halle Zoo, Halle, Germany) • **Vice Chair:** Marco Penello (Valcorba Zoo, Pozzonovo, Italy) and La Torbiera Zoo, Agrate Conturbia, Italy)

INTRODUCTION

The year 2021 was still a very challenging year for the EAZA Caprinae TAG due to the COVID-19 pandemic. The travel restrictions made it almost impossible to plan in-person meetings. Nevertheless, the TAG had two successful online meetings.



Amongst others, the EEPs for Takin (*Budorcas taxicolor*) and for Blue sheep (*Pseudois nayaur*) were approved according to the new EAZA population management structure © Dennis Müller / Halle Zoo

The mid-year meeting took place in May and most of the TAG members participated. The EEP Coordinators reported on their programmes, especially about the status of the process of developing the new style EEPs and the data migration into ZIMS for Studbooks. Nina Trontti (Helsinki Zoo, Finland) and Marco Penello (Valcorba Zoo and La Torbiera Zoo, Italy) presented the new Caprine Educational Guidelines and the members discussed how to proceed with the TAG's BPGs.

During the EAZA Annual Conference, the TAG had an open meeting. The Caprine Educational Guidelines were presented to the broad public, and we had interesting talks about new and non-invasive techniques to monitor welfare aspects (Ewa Wikberg, Nordens Ark, Sweden), re-introduction projects in the Apennines (Mario Cipollone, Rewilding Europe, Italy), and about re-introduction activities for the Alpine ibex (*Capra ibex*) during the last 35 years (Dirk Ullrich, Alpenzoo Innsbruck, Austria).

Unfortunately, Pascal Damois (Parc Animalier d'Auvergne, France) decided to step down from his position of Chair. The whole TAG would like to thank Pascal for his exceptional work during the last years and his willingness to further support our work in the future as a regular member. Dennis Müller (Halle Zoo, Germany; former TAG Vice Chair) was approved by the EEP Committee as TAG Chair.

POPULATION MANAGEMENT PROGRAMME DEVELOPMENTS

After the approval of the new style Caprinae RCP in November 2020 and the first approvals of the proposed new style EEPs within the TAG (12 in total), the last six EEPs were approved by the EEP Committee during 2021. These are:

- EEP for Alpine ibex (*Capra ibex*) coordinated by Martin Wehrle (Goldau Zoo, Switzerland)

- EEP for Aoudad (*Ammotragus lervia*) coordinated by Dennis Müller (overall Coordinator) and Jorge Cassinello (Experimental Station of Arid Zones (EEZA) - CSIC, Spain; Coordinator for *A. lervia sahariensis*)
- EEP for Blue sheep (*Pseudois nayaur*) coordinated by Elodie Rey (Ménagerie du Jardin des Plantes, France)
- EEP for Chamois (*Rupicapra rupicapra*) coordinated by Erich Kočner (Košice Zoo, Slovakia)
- EEP for Chinese goral (*Naemorhede griseus*) coordinated by Jonathan Appleyard (Edinburgh Zoo, UK)
- EEP for Wild goat (*Capra aegagrus*) coordinated by Ronald Renson (Monde Sauvage, Belgium)

The TAG thanks all the Coordinators for their willingness to take the position and their efforts to successfully run the programmes under the new EAZA population management structure. Among these new style EEPs, the Wild goat EEP is particularly special due to its intention to actively phase out the species within the collections of EAZA Members to free space for focus species.

ACHIEVEMENTS DURING THE YEAR

Nina Trontti and Marco Penello published the [Caprine Educational Guidelines](#) which are available on the EAZA website. This outstanding work was a matter close to our hearts, and we hope that the information and ideas they contain will inspire zoo educators around the world to promote the often-little noticed yet fascinating members of the Caprinae family.

Ewa Wikberg and Simone Haderthauer (Vienna Zoo, Austria) continued to work on the BPG for the husbandry of caprines. We decided to publish a common guideline for all caprine species with special references to those managed as EEPs. A template was created and it is now circulating among the EEP Coordinators to collect their input.

COLLABORATIONS

In January 2021, Pascal Damois was appointed as member of the IUCN SSC Caprinae Specialist Group, which will help to intensify the collaboration between the TAG and the IUCN.

CONSERVATION AND RESEARCH

The working group on assisted reproduction in Caprines in collaboration with our AZA colleagues stayed active. Yann Locatelli (Réserve de la Haute-Touche, France) and Budhan Pukazhenthii (Smithsonian's National Zoo, USA) are leading this group, but not much was done in 2021 due to COVID-19 restrictions.

ADDITIONAL COMMENTS

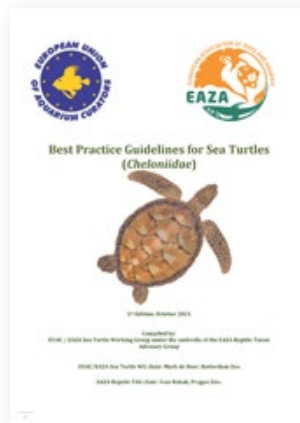
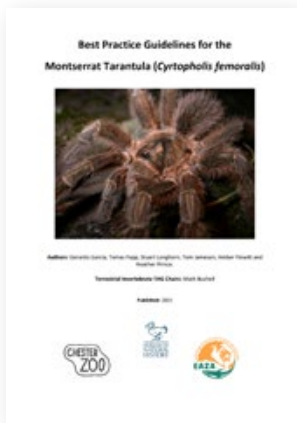
The following articles were published:

- Cassinello, J. (2021) *The paradoxical status of the aoudad Ammotragus lervia worldwide and the urgent need for a re-evaluation of its subspecific classification through genetic analyses*. Caprinae News, 1: 5-7
- Penello, M., Damois, P. and Müller, D. (2021) *A bright future for caprines*. Zooquaria, 111: 14-15

BEST PRACTICE GUIDELINES 2021

Nine BPGs, enabled in part by funding from an EU LIFE NGO operating grant and thanks to the efforts of Programme Coordinators and TAG members, were published on the EAZA website in 2021.

Montserrat tarantula • Noble chafer • Lake Patzcuaro salamander • Fire salamander • European pond turtle • Sea turtles • Virus Management for Parrots • Gelada baboons • White-faced saki monkey



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



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TAG Reports 2021

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