



**icZ**
2018
ARGENTINA

Fundación
Temaikèn



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MONDAY 15TH OCTOBER 2018

The conservation crisis of the birds of the Atlantic Rainforest in Brazil

Carmel Croukamp

The conservation crisis of the birds of the Atlantic Rainforest in Brazil is at present one of the most acute species conservation crises anywhere, with 120 threatened species and subspecies. The once massive forests are now 91.5% destroyed, much of this in living memory; the Atlantic Rainforest is the second-most biodiverse biome in the world.

I will tell the story of how we discovered the scale of this crisis, what we did about it, and what happened to us, and use it to explain why zookeepers and staff on the ground are vital to impact in conservation and education.

We were one of the most-visited pure bird parks in the world, complete with exotic and charismatic species from all continents. At the same time, Parque das Aves is situated in the Atlantic Rainforest, and upon discovering that a local species of ground-dove had gone globally extinct, we decided to change everything we did to focus on the problem, and risk ourselves by focusing on hundreds of ‘little brown jobs’: Species usually found to be uncharismatic, unattractive for visitation and uninteresting for conservation now make up the majority of the visitation experience and conservation focus. This involved considerable risk, which we decided to take together. In so doing, we became a species conservation powerhouse with the largest in-house field conservation nucleus of the zoos of South America and integrated conservation action that puts in barriers to extinction. At the same time we began playing with preconceptions about small, brown, uncharismatic species, and our data shows that visitor bonds and learning increased, whilst visitor numbers increased, too. How we see animal welfare, and our own investment in the animals, changed in profound ways when focused on local species - sometimes in surprising ways. The roles which Parque das Aves staff played in this are very special, and we would like to make the argument that it’s professionally worthwhile and empowers every one of us to embark on unconventional paths.

BIO

Carmel Croukamp

Carmel Croukamp grew up in the Namib Desert, Namibia, and then in the zoo founded by her parents in Brazil. She has a PhD in Sociology and Musicology from Oxford University and left her academic career to live in the jungle in Brazil eight years ago together with her husband and children. As director of development and communications, she built up the audience of Parque das Aves in Foz do Iguaçu to become one of the most visited bird parks in the world. During this time she was a consultant to the Association of Latin-American Zoos and Aquaria (ALPZA) and the Brazilian Association of Zoos and Aquaria (SZB) in crisis management and is the author of the ALPZA guidelines on crisis communications.

Since taking over as CEO of Parque das Aves, she transformed the Park into a One Biome Zoo exclusively focused on the conservation crisis of the birds of the Atlantic Rainforest, aligning population management and care, conservation, communication, education, design, and business culture into an evidence-based synchronized conservation focus, and with a number of in-house field conservation projects specialising in abandoned endangered species and ranges of forest.

Parque das Aves is the Brazilian headquarters of the IUCN’s Conservation Planning Specialist Group with a focus on conservation planning and training and developing the skillsets of conservation leaders throughout Brazil. Carmel is a member of the technical advisory council of the Brazilian Ministry of the Environment’s Na-

tional Action Plan for Conservation of the Birds of the Atlantic Rainforest. Her favourite activity is getting other people to love small, uncharismatic, mostly brown, animals.

The Importance of Keepers in Wildlife Veterinary Medicine

Martín Falzone: MFalzone@temaikén.org.ar

TEMAIKÉN FOUNDATION

The keeper is the first link in the care and prevention of diseases for animals under human care. The keeper is that person who works every day to provide optimal care for animals under their care. Therefore, they must know their biology, their correct diet and the best way to offer it; recognize abnormal behaviors; create more natural conditions in the enclosures; be able to identify the standard appearance of their feces, as well as be familiar with individual characteristics of the animals they care for.

Under the premise of the ecologic triad that states that there must exist a balance between harmful factors, the host and the environment, we can say that any imbalance of any of these items will allow for the development of diseases.

The keeper's work in training and management for restraints or veterinary treatment is essential in providing the best veterinary care.

In this presentation these points will be discussed and the keeper's role in veterinary daily work will be highlighted.

BIO

Martín Falzone

Martin Pablo Falzone is a veterinarian of Italian-Argentine nationality born in 1970. Within his academic training we highlight his degree in Veterinary medicine in 1997 at the University of Buenos Aires (Argentina) specializing in small animals. Likewise, between 2003 and 2010 he has participated in training seminars in different zoos around the world. Among them at Oceanogràfic (Valencia, Spain) and Wild Life Safari Park (Winston, USA). His professional career can be divided into two major stages:

The first started in 1997 after completing his university studies where he worked in several veterinary clinics performing different functions, such as veterinary assistance and afterwards of diagnostic and treatments, up to becoming chief veterinarian of one of the clinics in 2002 (Santa Rita Veterinary Clinic, in Boulogne, Buenos Aires, Argentina).

And secondly, in 2005 he joined the veterinary team of Temaikén Biopark (Escobar, Argentina) as a junior veterinarian, where he progressively acquires a higher status until becoming Veterinary Supervisor in the year 2011, a position he maintains still today.

Finally, it is worth mentioning that there have been numerous publications, as well as courses given and conferences held throughout his professional career.

The danish way

A reflective look at breeding and euthanasia in the modern zoo

K re Jensen: krethomasjense@gmail.com

In 2014 a giraffe was euthanized in Copenhagen Zoo. While standard procedure in Denmark, an international outcry and a zoo ethics and animal welfare debate followed. Several more cases, including lions in Odense ZOO and brown bears in Aalborg Zoo have caused similar uproar abroad. The debate on whether or not to use euthanasia for population management purposes is one of the most important discussions regarding the modern zoo, and while cultural gaps make it difficult, this presentation is meant as a perspective on the discussion as seen from the eyes of a Danish zookeeper:

Marius the giraffe was a young male (two years old) living in Copenhagen Zoo. He had been rejected from the group by the resident bull and was now living alone. The breeding coordinator in charge of the giraffe EEP could find no home for him, and his genes were deemed not valuable. He was euthanized quickly and humanely, and visitors to the zoo were allowed to view the subsequent dissection at an educational presentation with the zoo's veterinarian staff. After the presentation pieces of the meat were fed to the carnivores living in the zoo.

The policy of breeding and euthanasia is a common and openly accepted practice in Scandinavian zoos and occurs frequently with all kinds of animals. The philosophy behind it is that all animals have the same intrinsic worth. It is striking how certain animals, such as tigers, giraffes, bears and lions, cause international outcry when euthanized and used for educational purposes, while nothing is said regarding the dissections and feedings using boas, emus, camels and pigs. The Nordic animal welfare perspective focuses on quality over quantity, and the lifespan of an animal is not necessarily an indicator of good welfare. A short, high-quality life is perfectly acceptable if the euthanasia is carried out as humanely as possible.

These views are enforced openly to produce a healthy view of nature in our guests, in which life and death both play their part. The survival of biodiversity long term is the goal, and the preservation of the individual animal should not take precedence over this. If our zoos hide certain aspects of its operations it may lead to public distrust in the zoo as a scientific establishment.

Another reason for population management by euthanasia is that euthanasia, however ironic it may sound, also leads to higher individual welfare. Contraception in animals often leads to many side effects, including hormonal disturbances, physical ailments and lower fertility. Breeding behavior is one of the most important aspects of an animal's life and denying them this rules out one of the best environmental enrichment options we can provide for them.

The zookeepers in Denmark are proud to take part in this practice of animal population management and feel like they are doing important conservation work while providing the best possible care. This presentation is meant to build a bridge between opposing viewpoints. While our methods may differ our goals are the same, and come from the same fascination of the natural world.

BIO

Kåre Jensen is a 28-year old trained zookeeper from Denmark, currently residing in Copenhagen. He has six years of zookeeping experience in Danish zoos and aquariums, including Odense Zoo, Copenhagen Zoo, Ree Park Safari and The Blue Planet - National Aquarium of Denmark, working with many kinds of animals. Besides daily zookeeping work, a large amount of his time is spent studying zoo design and ethics as well as visiting as many zoological institutions as possible.

Global Collaboration for Animal Welfare

Sabrina Brando

WAZA'S ANIMAL WELFARE COORDINATOR

World-leading zoos and aquariums that are members of the World Association of Zoos and Aquariums (WAZA) have a continuing commitment to achieve the highest standards in animal welfare. Promoting optimal animal welfare is one of the core responsibilities of all zoos and aquariums (zoos) today, and is fundamental to successful education, research and conservation programs.

The current WAZA Animal Welfare Strategy covers nine different topics, providing a short introduction and theoretical background, specifies recommendations and includes an action point checklist at the end of each chapter. While some of topics will require extensive planning and resources, as well as being time consuming, many day-to-day animal welfare related efforts can be more easily implemented.

Dynamic environmental enrichment programs, easy modifications to exhibits, attention to cleaning and maintenance procedures, a focus on positive human-animal interactions, offering complexity, choice and control, are all examples of areas where differences can be made, and positive welfare can be promoted. Daily behavioural observations, individual and group specific record keeping, and regular reviews of the collected data allow for evaluation and modification, or to immediately address problems. While awaiting major data collection or environmental changes, daily animal welfare efforts to providing choice and control and promote positive welfare can and should be executed where possible today. WAZA Twinning for Animal Welfare program underscores our shared commitment to maintaining, improving and actively encouraging optimal animal welfare in all wild animals in zoos and aquariums worldwide. The WAZA Animal Welfare Strategy “advocates improving animal welfare and for better collaboration and partnerships between zoos and aquaria to achieve and enhance positive animal welfare”. This presentation will give an overview of the WAZA Animal Welfare Strategy, practical examples of great animal care, and highlight the importance of global collaboration for animal welfare.

BIO

Sabrina Brando is the WAZA Animal Welfare Coordinator. She has been working in the zoos and aquariums community for 26 years. Sabrina worked for 15 years as a zoo professional with a wide variety of species. Sabrina is the owner of animal welfare and behaviour consulting company AnimalConcepts since 2004, and since August 2017 she works full-time for WAZA. Sabrina is a psychologist specialised in animal behaviour and welfare, and completed a MSc. in Animal Studies, focusing on the human-animal interaction. She has published many peer-reviewed articles and book chapters, including her collaborative article and workshop on the 24/7 concept of animal welfare across lifespan.

Are you a committed keeper?

Ra I Cabrera: rcabrerao7@hotmail.com

ICZ/BARCELONA ZOO

Keepers are a key element in the zoological industry. No zoological institution would be suc-

successful in terms of animal welfare, breeding success, sustainable use of facilities, if their caregivers were not trained, motivated and inspired to perform their task.

But can we improve the work we have assigned? Can we do something more inside and outside our zoological institution?

In this presentation we will share how to improve our work while taking into account various factors such as respect for the environment and having less impact on it, or the current problems experienced by zoological institutions: questioning and pressures from animal activists, and society. But we will go further, we will review actions that are available to all, including caregivers, and that involve a qualitative leap in giving the importance it deserves to our profession, and its image.

Previously a keeper's job was to clean and feed, and now in more and more institutions the caregivers are involved in enrichment, training, education and educational plans. It is this "privileged" position that we must use to promote good environmental practices towards colleagues, visitors or our environment. And it is that commitment that should not be left only in our work but applied day to day.

BIO

Raúl Cabrera is a biologist by Barcelona University and works with primates since 1997.

He worked as Head Keeper in MONA Primate Rescue Centre, and as Primate Keeper at Las Águilas Jungle Park, Madrid Zoo-Aquarium and currently at Barcelona Zoo, where he started his career.

He has learned in some of the best primate centres in Europe during his stages at "Durrell Wildlife Preservation Trust" and "Monkey World" (both in UK) and Apenheul (NL), and has cooperated with in situ conservation centres such as Orangutan Foundation (Indonesia), Limbe Wildlife Center (Cameroon), Lola Ya Bonobo Sanctuary and Lwiro Primate Rehabilitation Center (both in RDCongo), and Endangered Primate Rescue Center (EPRC), Vietnam.

President of NGO SOSPrimates, association created in 2012 to help fundraising CRPL and support the primate rehabilitation centers in general.

He is one of the two AICAS (Spanish and Portuguese Wild Animal Keepers Association) representatives in ICZ.

He is the Chair of the ICZ Conservation Committee.

Whale strandings

Lic. Sergio Rodríguez Heredia MSc: pappoblues@gmail.com

RESCUE AND REHABILITATION CENTER FOR MARINE WILDLIFE AT FUNDACI N MUNDO MARINO

Considering the persistence in which these types of events occur in our area, it is very important that the people who are a part of our zoological institutions have the basic tools to be able to collaborate and even lead these types of situations.

Content:

- General considerations
 - Protocols
 - Elements
-

- Personnel safety
- Managing the press
- Zoological institutions implications in these types of events

BIO

Sergio A. Rodríguez is a biologist and has a master's degree in Environmental Audits and Management, specializing in marine wildlife rescue and rehabilitation.

He has been working for 25 years as Head of the Mundo Marino Foundation for the provincial's Marine Wildlife Rescue and Rehabilitation Center in San Clemente del Tuyu, Buenos Aires, Argentina.

His work is linked to assisting traumatized pinnipeds, cetaceans, birds and turtles: which includes rescue, handling, feeding, therapeutic support, necropsy, environmental enrichment, sample collection, facility design, pre-reintroduction exams and coastline monitoring, as well as conservation projects layout. In addition, he has great experience artificially breeding Magellanic penguins, an effort he has carried out since 1993.

He is member of the Mundo Marino Foundation's Education Department, arranging and conducting courses for students and professionals. He has also offered training for rescue and rehabilitation of marine wildlife in courses organized by National and Provincial government offices in various Argentinean provinces, as well as in other South American countries (Chile, Peru, Brazil, etc.).

He is co-author of the Action Plan for Environmental Crisis: general procedures to deal with massive petrol encroachment on penguins (Argentina, 2005).

Sergio Rodríguez Heredia has been a member of the International Fund for Animal Welfare (IFAW) Emergency Team since 2005, assisting and participating at various oil spills as well as providing training and supervision for volunteer personnel.

He is a part of the Conservation and Aquariums committees of the Latin American Association of Zoological Parks and Aquariums (ALPZA). He is also a founding member of the Regional Program of Research and Conservation for Sea Turtles in Argentina (PRICTMA).

He has participated in more than 100 scientific presentations and has published a guide on dealing with birds in oil spills and another on handling and rescuing beached pinnipeds.



Welfare: 24/7 across the lifespan

Sabrina Brando

Workshop 1

Goal: To complete the table in relation to ONE specific animal/specific group of animals you and the group are familiar with.

Questions concern the natural adaptations of the species, and how well the individual/group in captivity match these. Please think about details. For example, if you are answering a question regarding locomotion, try to think about all the ways an animal might move. A bird does not fly in only one way, but there are many aspects to flying such as swooping, gliding, diving, turning. Other factors such as distance and height the birds naturally fly in, together with their field of view, and the environment they land on are also important. Describing the details allows us to highlight what natural adaptations and capacities animals have and how this compares to the

current environment of the individual/group.

Outcome: a list of areas where there is a mismatch that MAY require additional intervention to promote welfare.

Workshop 2

Using an adapted version of the Animal Welfare principles and criteria formulated by Welfare Quality[®] complete the table providing evidence you are meeting welfare principles (e.g. what evidence/provision), and if not what steps are being taken to address it? An example might be that you are thinking of land use, try to consider the different complexities like substrates, levels, resting, sleeping and or hiding places, shades and/or transition into water if this is applicable to the species. This can also be related to details on foraging behaviour or social interaction. Describing the details allows us to consider the current environment of the individual/group and how this compares to what we think animals need and want. Think about ALL individuals in the group, and across all seasons, events etc...

Outcome: a list of areas where you feel that the evidence/provision is lacking (noting age/seasonal differences).

Workshop 3

Outcome: a list, in order of priority, of up to three actions to take forward, together with the rationale for action.

Basic assumptions:

- To optimise welfare, and ensure “fit for purpose” (e.g. specific requirements as research model, zoo exhibit, candidate for reintroduction, companion animal, farm animal etc.).
- Consider the birth to death experience, to take into consideration age profile, seasonal changes, climatic and routine/work changes (e.g. training shows, visitor numbers, study requirements).
- Consideration of primarily individual animal welfare but also the need to consider effect other members in group, care staff, visitors (veterinary care etc.).

Complete the following table in relation to ONE specific animal/specific group of animals that you are responsible for the welfare of/care for.

TUESDAY 16TH OCTOBER

Yara Barros

BIO

Yara Barros is the Executive Coordinator of the Project Jaguars of Iguazu, which works to save the jaguar population of the Iguazu Falls National Park in Brazil.

Yara was the Technical Director of Parque das Aves for 8 years, and also the Head of the Conservation Division of that institution. She was also the President and the Communications Director of the Brazilian Association of Zoos and Aquaria, and during this period she tried to raise the standards of Brazilian zoos, and supported the creation of a Brazilian association of zookeepers (ABTAS).

She worked for 8 years to the Brazilian Government, to the agencies responsible for environment protection. Before that, she was at the field coordinating the Spix's Macaw Project, trying to save this extremely endangered macaw before it disappeared from the wild.

Yara participates on official committees that work to protect endangered species, like some threatened Amazon species and Lear's Macaws.

She is currently the coordinator of the Ex situ Program of Harpy Eagles, within the Harpy Eagle Project.

She also integrates the team of CPSG Brazil (Conservation Planning Specialist Group/SSC/IUCN).

Yara is a biologist and holds a PhD in Zoology.

The Individual in the Bigger picture.

A male Sumatran Tiger's integration and habituation to a new environment, with a positive welfare state outcome..

Joanne Richardson

WELLINGTON ZOO, NEW ZEALAND.

The breeding of critically endangered species in zoos is a critical role of conservation and advocacy for many. This is accomplished by ensuring healthy, diverse genetic populations are maintained for species through regional and international studbooks. Individual animals are recommended to breed due to their genetic importance and compatibility. Individuals are then moved between zoos to accommodate the successful breeding of a species.

In 2014 at Wellington Zoo Trust, New Zealand, 1:1 Sumatran tigers arrived with the intention of breeding the pair. The female was parent reared, the male hand reared and both had come from different zoos within Australasia with different management styles in their past zoos.

The male tiger on arrival was observed by his keepers not coping with the major transition to his new environment, new keepers and management style. A variety of behaviours were observed in the male tiger that indicated that complex action was required to support the tiger in the transition to his new territory and home. A major management plan was implemented by his

keepers, to support this tiger with this transition.

This presentation will discuss the details of the excellent animal management and care that was executed at Wellington Zoo Trust to ensure the male tiger's welfare was prioritised and met, with the aim of a positive welfare state for the individual in the bigger picture of conservation, using the five domains model. The considerations that zoo's should make before importing and exporting individual animals, and strategies that can be implemented to ensure the individual animals' needs are considered in balance with the requirements of studbook breeding recommendations. The journey that this individual tiger experienced within his new 'home' and the positive outcome of four years of dedicated care and management created for one animal, while aiming to have the successful outcome of contributing to the breeding program of this critically endangered species.

BIO

Joanne Richardson is the Animal Care Manager at Wellington Zoo Trust, New Zealand. Joanne manages the daily operations and the long term strategic planning and implementation of the animal care team and the animal collection.

Joanne has worked at Wellington Zoo Trust for four and a half years, and has worked within the zoological field for 17 years. Joanne's passion for conservation and her main interest in animal behaviour has led Joanne to work with all taxa during her career, and specialising in primates and carnivores.

The importance of animal welfare during the transformation process at Buenos Aires City Interactive Ecopark

María Florencia Presa: florenciapresa@buenosaires.gob.ar

HEAD OF ANIMAL BEHAVIOUR

Guillermo Wiemeyer

MANAGER OF ANIMAL WELFARE. BUENOS AIRES CITY INTERACTIVE ECOPARK

The restructuring process of the former Buenos Aires Zoo, spurred by law N° 5.752/2016, began with the planning and implementation of a series of modifications which were supported by general transformation guidelines, approved in May 2018, with the main objective of addressing process needs.

One of the major objectives was to achieve the highest standard of animal welfare. During the first stage, different strategies were planned to improve the quality of the animal's residence at the facility and evaluate and identify those species/individuals that could or could not be transferred to other facilities.

In order to accomplish the objectives mentioned above, architectural projects and suitable work teams needed to be involved. In this context some animals were moved to new enclosures built to fulfill behavioral needs of individuals and new social groups were planned for other species. On the other hand, due to construction improvements in management and holding areas, several animals had to get used to living with machinery, work staff and building material.

This process was complemented with the creation of a new area called "Animal Care," a result of the fusion of the Keeper and Animal Behavior Departments, which reorganized the teams to develop the different strategies: development of environmental enrichment and training programs, work protocols, new animal care technics, training, introduction of animal welfare evaluation indicators, and the restructuring of the keeper teams.

Each of this work issues were developed following extensive studies carried out by an interdisciplinary team and is continuously assessed to ensure constant improvements. Additionally, reports were prepared on animals that were geriatric and chronically ill and unable to be transferred.

These early stages of progressive transformation of the former Buenos Aires Zoo requires thorough interaction of all the park's areas. The "Animal Care" area is responsible for the daily care of the animals and the improvement of their quality of life, making animal welfare the starting point and priority for every change and stage of the process.

BIO

María Florencia Presa

I worked at Buenos Aires Zoo for 9 years as an assistant in the Environmental Enrichment Area. After that I spent 11 years at Temaikèn Foundation being part of the Keeper and Animal Behavior Team. Currently I am working at Ecoparque Buenos Aires where I'm in charge of the Animal Behavior Area.

Apart from that, I belong to the Steering Committee of GACAS (Argentinean Group of Wildlife Animal Keepers).

The Scientific, Technologic and Educational Center "Acuario del Rio Paran " (Paran River Aquarium): The first experience in measuring animal welfare in 4 species of native fish

Clara Mitchell: claramitchelling@gmail.com

Alexis Grimberg, Lidiar Mansur, Vanesa Frea, Andrés A. Sciara

TECHNOLOGIC AND EDUCATIONAL CENTER "ACUARIO DEL RIO PARAN "

The Paraná River Delta is composed of a great variety of environments which makes this place one of the unique ecosystems in the world. Considering its importance and the lack of knowledge about it in the scientific community and in society in general, the main objective of the Scientific, Technologic and Educational Center "Acuario del Río Paraná" is to promote a cultural force for conservation, breed knowledge, provide scientific education, and to promotion of the culture that is associated with the Paraná River.

Structurally the Paraná River Aquarium includes a research area, an education area with aquariums measuring 1.000 m² and 10 fish tanks with 180.000 litres of water that represent different environments of the Paraná River Delta and which contain more than 100 species of native fish, an interactive area with technological terminals, and an auditorium. There is also a themed Indigenous Park with more than 50 trees species and 5 different biomes represented.

One of the main activities of River Paraná Aquarium is the animal welfare and environmental enrichment program, part of a Training Program where residents work together with aquarists, technical staff and the scientific staff.

During the first experience, 4 species were part of the program:

- Golden Dorado (*Salminus brasiliensis*) – an individual named “Pancha”
- Black river stingray (*Potamotrygon motoro*) – an individual named “Úrsula”
- Dimerus cichlid (*Cichlasoma dimerus*) – a school of fish
- Red piranha (*Pygocentrus nattereri*) – a school of fish

Paraná River Aquarium has developed their own signs to identify the conditions of the animals and to detect the points that could improve or modify. These indicators are:

- Institutional indicators: mechanical procedures, staff training, codes indicating good practices, and contingency plans.
- Aquarium indicators: water parameters and any variations, photoperiod, quantity of animals, shelters and feeding records.
- Individual/School indicators: animal behaviour, environmental enrichment, optimal food items, nutrition and health status.

To get objective measurements of some of these parameters, like nutrition and health conditions, alternative methods had to be created and some protocols (such as weighing or blood collection) were not implemented on those animals that were part of sample group strictly necessary.

All these parameters were brought together into a formula that allowed us to determinate the animal’s general welfare and where improvements can be made.

In the first stage, thorough research on scientific and experimental information was investigated, which turned out to be scarce for many of our native species. Then, respective ethograms were developed, their behaviours in the aquariums were analysed, measurements on the animal welfare were made and environmental enrichment improvements were considered

BIO

Clara Mitchell

I graduated as an Industrial Engineer from the Universidad Nacional de Rosario in 2013. I have focused my career in the field of environmental conservation. In 2015 I started working as Coordinator of the aquariological area in the “Centro Científico, Tecnológico y Educativo Acuario del Río Paraná” and I’m responsible for the animal welfare and environmental enrichment program, Plastic Program (reduce the use of plastic and internal waste management) and the studies of the plastic’s effects on the Paraná River basin, among others.

At the same time, I teach at the Universidad Nacional de Rosario and I am an ad honorem protector of native fauna for Santa Fe State, fighting against illegal wildlife trafficking in social networks. I was granted Diploma of Honor of the City of Rosario granted by the City Council for my work in this role.

Your pace or mine? Does the provision of environmental enrichment successfully decrease locomotor stereotypic behaviour in a single-housed striped hyena (*Hyaena hyaena*): A comparison of food-based, sensory and physical enrichment.

Demi Booth: demi Booth@yahoo.co.uk

DUBAI SAFARI

Abstract

Satisfying the physical and physiological needs of animals in zoos can often be a difficult task, made more challenging when dealing with species that have already developed stereotypic be-

haviours. Carnivores in captivity spend a high proportion of their time budget performing locomotive stereotypies as it is impossible to replicate the large ranging distances of carnivores within a zoo environment. Abnormal stereotypic behaviours can be used as an indication of poor past, or current welfare as these behaviours are not part of the natural behavioural repertoire of their wild counterparts. This study investigated whether the provision of sensory, food-based and physical enrichment devices successfully decreased pacing in a solitary housed female striped hyena (*Hyaena hyaena*). Over a period of 14 days, the animal was introduced to novel enrichments on a randomised schedule with alternate control days where no physical enrichment was given except being released to a large on-show exhibit area. Behavioural observations were carried out for one hour whilst the animal was in the outside exhibit and for another hour immediately after she confined from the exhibit inside her den. Data was recorded every 30 seconds using instantaneous sampling. It was observed that the animal paced more vigorously when keepers were present, so a video camera was set up to record behaviour whilst the animal was in the den to obtain a true representation of her activity when keepers were not around. From the results of this study we can see that pacing was most prevalently displayed behaviour for the hyena whilst she was confined inside her den. Whilst each method of enrichment had varying degrees of success, the results indicate that the pacing behaviour was decreased most in the den when the ungulate skin enrichment was given (6%) and was highest when the rhino faeces in a hessian sack was presented (79%). The behaviours displayed by the animal were most diverse and stationary behaviour was lowest when the hidden snake skins were present in the den (1%). Whilst the ungulate skin could be considered the most successful enrichment at decreasing the pacing stereotypy inside the den, it is important to note that the most successful enrichment overall was providing the animal with access to the on-show exhibit; this large, novel and sensory-rich environment eliminated the pacing behaviour for 13/14 days during the study duration; pacing occurred on the final day of the study for 2% of the animals activity budget. Whilst it is evident that this enrichment was very valuable, it can be hypothesized that this pacing behaviour will continue to increase as the area becomes less novel to the animal and the provision of other enrichment devices in this exhibit area will help to decrease this behaviour. The results of this short study would strongly suggest that the welfare of the hyena was greatly improved by the provision of different types of environmental enrichment, that enabled the animal to display stronger natural behaviour and decreased much of the stereotypic behaviour. This paper explains in more detail how the enrichment staff at Dubai Safari met the challenge and set about changing the stereotypic behaviour of this animal and the methods employed to monitor the results.

BIO

Demi Booth

I am a Zoo Biology graduate from Nottingham Trent University. I currently work at Dubai Safari Park, UAE, as an ungulate keeper, now primarily working with giraffe and common hippos, I also have a background in primates and small mammals.

I have worked at the Dubai Safari for the past 2 years, and along with being a keeper, I am also the enrichment officer for the park. I plan, implement and evaluate enrichment for the animals at Dubai Safari.

Ntondo – training for treatment of bilateral glaucoma

Kathleen McMahon: kcmahon@wcs.org
WILDLIFE CONSERVATION SOCIETY, BRONX ZOO.

Ntondo is, to date, the only gorilla known to be diagnosed and undergone treatment for bilateral glaucoma. The treatment has included two laser eye procedures, oral medications and daily voluntary eye drops. Managing a newly visually impaired silverback gorilla has been challenging to ensure his welfare and quality of life as well as that of his troop mates. A significant effort was made to establish a behavior to administer daily eye drops and monitor any changes to his eyes. Ntondo participated in training the day following the initial laser procedure and the first drops were administered within a week. In addition to modifying our husbandry for the troop we have made alterations to their holding areas to increase Ntondo's mobility. Tactile patches were added to the floor of the holding areas to signify to Ntondo where ladders to overhead shifts are located and verbal cues from staff were used when moving the troop. Troop members often vocalize and shift closely to Ntondo when moving through the overhead areas.

In a post-surgery follow-up examination, it was discovered that Ntondo had developed diabetes. It was potentially a side effect of long term use of a medication used to manage his pre-existing irritable bowel syndrome. Since the diabetes diagnosis his medications have been adjusted, his diet changed, and daily blood glucose and urinalysis have been monitored. While transitioning between irritable bowel syndrome medications his weight and body condition were monitored closely. High calorie supplements were added to his diet and weekly weights were recorded. To test blood glucose levels, Ntondo has been trained to allow daily blood samples from his toes to be taken. Monitoring blood glucose levels and urinalysis voluntarily has enabled the diabetes to be managed orally and limiting the impact it has had to Ntondo's welfare. The last two years have been a continued effort to maintain Ntondo's health and well-being while ensuring the best possible care for the entire troop.

BIO

Kathleen McMahon

Kathleen McMahon began her career at the Philadelphia Zoological Society in the Education Department as an environmental educator. Through her time in school at Delaware Valley College in Doylestown, Pennsylvania she completed internships with the Elmwood Park Zoo's education department as well as a behavioral research internship at the Central Park Zoo. Once completing her internships she then spent time volunteering at the Santa Martha Hacienda in Ecuador to gain additional hands on husbandry experience.

Currently, Kathleen is a Senior Wild Animal Keeper at the Wildlife Conservation Society's, Bronx Zoo in New York, New York. She has been a member of the Bronx Zoo's mammal department for over ten years and has worked with taxa ranging from pygmy marmosets to giraffe. Currently, Kathleen is working in the Congo Gorilla Forest exhibit which houses 55 species indigenous to the Congo basin.

Physical fitness through enrichment: Let's Get Physical

Valerie J Hare: shape@enrichment.org

CO-FOUNDER, WORKSHOP COORDINATOR, THE SHAPE OF ENRICHMENT

Abstract

Environmental enrichment, as a concept, is now well recognized as an important consideration in the welfare status of any captive animal. The behavioral, psychological, and physical benefits of enrichment are well documented.

Since the early days of enrichment, many have touted its benefits for physical health, usually through increased activity. While surely beneficial, we believe that the more common enrichment strategies used to encourage activity today do not provide the animals with opportunities for appropriate types or sufficient levels of exercise.

We have an ethical responsibility to provide all animals in our care with good physical, psychological, and behavioral health but also with good physical fitness. And, for animals destined for reintroduction, it is imperative that each animal possesses the requisite strength, sense of balance, and fine motor control to survive and succeed on its own.

Thus, we propose that animal enrichment programs include strategies designed to address these needs and we will present examples of such. But, as with all enrichment, we encourage animal care professionals to continue to develop new strategies geared toward providing opportunities for appropriate types and levels of exercise.

BIO

Valerie Hare

Valerie Hare is the Co-Founder and Workshop Coordinator for The Shape of Enrichment, a non-profit corporation that was founded in 1991 and is dedicated to promoting worldwide environmental enrichment for captive animals and improvements in animal welfare.

Through The Shape of Enrichment, Valerie offers worldwide workshops, publications, and support to animal care professionals who wish to learn the process of creating, implementing, and assessing enrichment plans for the animals under their care. She has assisted with the planning of the International Conferences on Environmental Enrichment (ICEE) and Regional Enrichment Conferences since 1997, and was a founding Director of the Bear Care Group, serving on the Board from 2007 – 2014.

Valerie has also been a keeper, Enrichment Consultant, and Behavior Research Technician for the Zoological Society of San Diego from 1994 to 2003, where she collected giant panda behavioral data, conducted enrichment planning and assessments, and cared for a variety of mammal and reptile species.

Valerie instructs enrichment workshops through The Shape of Enrichment and has been invited to speak at Conferences, Universities, and wildlife reserves in Australia, Brazil, China, Russia, and many other locations all over the world.

Valerie holds a Bachelor of Science Degree in Biology (Zoo emphasis) from San Diego State University and an Associate Degree as a Veterinary Technician from State University of New York – Delhi.

Enrichment assessment workshop

Valerie J Hare: shape@enrichment.org

CO-FOUNDER AND WORKSHOP COORDINATOR, THE SHAPE OF ENRICHMENT, INC.

Abstract

One of the often-forgotten components of an effective enrichment plan is assessment. It is imperative that we assess, at some level, our success at meeting our enrichment goals. For most zookeepers, whether the assessment is simple or complex, it will be based on behavior.

This workshop will introduce the participants to some basic behavior data collection techniques. Both continuous (all-occurrence) and timed (instantaneous) sampling methods will be presented, as well as a sample Enrichment Interaction Rating. Attendees will practice some these techniques by scoring videotaped behavior.

The curriculum is designed for persons unfamiliar with these techniques who are interested in using more objective methods to ascertain the effectiveness of their specific enrichment plans. This talk is appropriate for animal caretakers and all others interested in learning techniques to assess enrichment effectiveness.

Building enrichment workshop

Valerie J. Hare: shape@enrichment.org

THE SHAPE OF ENRICHMENT, INC., SAN JOSE, CALIFORNIA, USA.

María Florencia Presa

HEAD OF ANIMAL BEHAVIOR REA, ECOPARQUE INTERACTIVO DE LA CIUDAD DE BUENAS AIRES.

Cristian Gillet

BEHAVIOURAL HUSBANDRY MANAGER, BIOPARK TEMAIKÉN

Abstract

Following a short introductory lecture, participants will be divided into small groups. Each group will assemble one or more enrichment devices according to building plans provided. Due to time constraints, many of the pieces will be pre-cut and/or drilled.

After the workshop, some or all of the devices will be presented to select animals at Biopark Temaikén. We will do our best to obtain photos or videos of the devices in use that we can show during a lunch or coffee break.

While the cutting and drilling will be minimal, this is an activity-based workshop. Please come prepared to work and wearing appropriate clothing.

Workshop:
Beak and talon maintenance in captive birds

Andrés Capdevielle

In this workshop we will learn about:

- General considerations for when and why keepers should clean the beaks and talons of some of our captive birds.
 - We will see some examples of “normal” overgrowth found in captivity as well as minor deformities and how to treat and fix them.
 - We will be able to determine the point of no return in overgrowths where intervention with manual and/or electrical tools is the only way to correct them.
- How to properly restrain during procedures and cautions we must take due to bird anatomy and physiology.
 - Light and temperature
 - Anatomical structure concerns during restraint
 - Limits when filing overgrown beaks and talons
- The types of tools needed for filing, along with their advantages and dangers.
- The various beak presentations and how to repair them depending on the species’ beak functionality, while appealing to our inner artist.
- We will use beak molds, mini-screws, pliers, and files; participants will be able to practice the concepts demonstrated during the workshop.

BIO

Andrés Capdevielle

Andrés was a keeper for 15 years at Buenos Aires Zoological Garden (JZCBA). He’s a founding member of GACAS (the Argentinian Wildlife Keepers Group) and is its current vice-president. He is the president and founder of the non-profit Caburé-Í, an organization dedicated to wildlife conservation and environmental education.

*He has been coordinating and leading the Birds of Prey Conservation and Rescue Program and the city of Buenos Aires’ Independent Wildlife Rescue Center. This facility has received and rehabilitated over 500 wild animals that have been affected by wildlife trafficking, injuries, and trauma due to human interactions. He also develops field projects for endangered species such as the crowned eagle (*Buteogallus coronatus*).*

Federico Bondone

Federico graduated from the Buenos Aires University as a veterinarian. Since 2001 he has been involved with wildlife rehabilitation and conservation projects. He also has extensive experience in environmental education, delivering many public and special presentations, designing courses and conferences, and visiting wildlife refuges. At the moment, he works as a veterinarian at the Wildlife Rescue Center in Buenos Aires and in the private sector as a veterinarian for non-conventional wildlife companions.

Workshop:

The keeper as an observer: from dominator to nurturing technician. The transformation from keeper staff to technician.

Ferrari, H, R.

ETHOLOGY PROFESSOR AT FCNYM- UNLP / ANIMAL WELFARE PROFESSOR AT FCVET-UBA

As a result of incorporating Animal Welfare as an essential aspect in all human-animal relationships, especially in husbandry practices, keepers who look after wild animals under human care have to renovate themselves as professionals with specific skills and knowledge. Two of these skills are the ability to describe behaviors and record behavioral signs. Here we will propose steps for this change, the limitations they may find in Argentina, and the convenient institutional items.

BIO

Hostor Ricardo Ferrari

Biology graduate with a major in Zoology (UNLP), qualified in Science Teaching (FLASCO), a master of science's degree in Anthropology (UNC) and a PhD in Natural Sciences (UNLP).

Head teacher of Animal Welfare at the Veterinary Sciences faculty (UBA). Ethology teaching assistant at the Museum and Natural Sciences faculty (UNLP), and Animal Welfare and Ethology postgraduate courses teacher at Exact and Natural Sciences faculty (UNC).

WEDNESDAY 17TH OCTOBER 2018

Fauna aid in hydrocarbon leaks course

Dra Valeria Ruoppolo

Lic. Sergio Rodríguez Heredia MSc

- Marine fauna and oil: general considerations
- Emergency Response (first, second and third degree response, step description)
- Aid centers (establishment, development, needed infrastructure, general needs, etc.)
- Handling of oil covered marine fauna: general handling: rescue, transport, stabilization, cleaning techniques, etc.
- Veterinarian protocols for assisting marine fauna.
- Marine turtles and pinniped aid and rehabilitation, general considerations.

BIO

Valeria Ruoppolo

Valeria Ruoppolo, is a veterinarian with a Master's degree in Animal Pathology. She has been a member of the Emergency Relief Team of the International Fund for Animal Welfare (IFAW) and International Bird Rescue Team since 2000. She has participated as part of the management team in several wildlife rescue efforts around the world including the "Treasure" (South Africa), "Jessica" (Galapagos), "Prestige" (Spain), "Rocknes" (Norway), "Coatzacoalcos" (México), "Eider" (Chile), "Syrius" (Uruguay and Brazil). In Argentina, she has worked in other response emergencies with oil spill, including "Cabo Virgenes", "Santa Cruz" or "Caleta Córdoba", Chubut.

As one of the founding members of the NGO Projeto BioPesca - dedicated to monitoring cetaceans and sea turtles by-catch, in São Paulo, Brazil, Valeria has participated and coordinated several research projects in collaboration with the University of São Paulo.

Working with marine animal husbandry, disease and rehabilitation since 1995 at the Sea World Foundation, she has dedicated lots of her time to penguins and seals, having spent two summers in Antarctica as part of both, Brazilian and United States Antarctic Programs. Since 2010 she is the Director of Aiuká, a Brazilian organization dedicated to the development of specific contingency planning for animals and their rescue in environmental emergencies.

Can presentation of a favourite food decrease abnormal behaviours in Asiatic black bears (*Ursus thibetanus*)?

Geraldine Tang

Cecilia Tang

Francis Cabana: francis.cabana@wrs.com.sg

WILDLIFE RESERVES SINGAPORE, 80 MANDAI LAKE ROAD, SINGAPORE, 729826

Various forms of repetitive behaviours have been recorded in many large carnivore species under human care. Possible causal factors for such behaviours include incapacity of the animals to

tackle ecologically relevant problems, presence of stress and fear in the environment, or the lack of stimulation. While some literature postulates such behaviours to be a manifestation of stress, others suggest them to be a form of coping mechanism for a negative welfare state. Regardless, fixations on repetitive behavioural patterns prevent animals from interacting with their environment in a species-typical fashion and limit their behavioural diversity, thereby adversely affecting their welfare. Ursidae species, like other large carnivore species, have commonly been observed displaying abnormal behaviour under human care. The 1.2 Asiatic black bears (*Ursus thibetanus*) at Night Safari (Singapore) have been observed head rolling and pacing. As part of an effort to achieve desirable mental domain of positive welfare state for this animal, this study investigates if an environmental stimuli using only their preferred foods can lead to their optimal psychological and physiological well-being.

We provided their favourite food (ant eggs) in three different categories of enrichment, each containing four treatments: sensory (cold, frozen or warm ant eggs, or only the scent), occupational (two different puzzle feeders either accessible or buried) and nutritional (ant eggs on leaves, scattered in small or big clumps). Under each treatment we observed their behaviour and enclosure use (spread of participation index). A total of 64 days were carried out for this study, with three hours of data collection per day separated into counterbalanced blocks. Our General Mixed Model Analysis revealed that the category of enrichment only had a significant effect on investigatory behaviours (occupational enrichment tripled investigatory behaviours), while the treatments themselves did not have a significant effect on their behaviour or enclosure use. Abnormal behaviours were at their lowest with occupational and nutritional enrichments (7.7 % down to 3.6% and 4.6 % respectively). Foraging behaviours were at their highest and inactivity at its lowest with sensory enrichments (24.7 % up to 34 % and 62.6% down to 51.2 %). Enclosure use was highly uneven (averages for each category ranged from 0.85 to 0.88 where 1.0 is using only one zone and 0 using all zones equally) and was not affected by the different enrichments.

It is tempting to use a favoured food item and label it as enrichment since keepers are able to see the animal is keen to interact. The reality may not be what keepers perceive as food-based enrichment is often short lived and does not necessarily have a carry-over effect throughout the day. Various enrichment types affect each individual animal in a slightly different way; providing one category at a time may not be the most conducive to reduce abnormal behaviours. Enrichment activities that are more complex and involve more than one category may be the way forward in minimising undesirable/abnormal behaviours in this species. Favourite foods may be more beneficial if used as rewards for training as opposed to enrichment for bears. ▯

BIO

Geraldine Tang

I am Geraldine Tang, a Senior Keeper under WRS Carnivore and Small Mammal. Currently caring for Malayan tigers, Indian wolves, Red dhole and Asiatic black bears. Have been working under Zoology for 7 years and have cared for multiple species of animals throughout this time. Enjoy making new enrichment devices and interacting with the animals. Strong interest in canids, especially Red dhole.

A Change in Keepers

Buenos Aires City Interactive Ecopark

Fernández Levach Martin Pablo: Levachmpf@gmail.com

A keeper's job is a unique job, it's one that requires practical and theoretical knowledge in animal biology, public service, and of course, animal husbandry and well-being.

Within institutions, keepers are one of the most active. In Argentina, until a few decades ago, most positions were occupied by personnel whose profile and training were based on animal infliction. Keeper teams were even lead by supervisors whose training emphasized control through power, authority, and lack of willingness to try new tools in the field such as training and enrichment. This, plus the lack of standardized education and training, generated different "schools" within the same facilities, erosion amongst teams, and lack of long term commitment. Nowadays however, significant changes are being generated worldwide, transformation is setting, and drive is being implemented through leadership, inspiration, enthusiasm, and above all, in the education and training of keeper teams incorporating new tools and concepts, and the fundamental philosophy of prioritizing animal welfare.

As of June of 2016, the Interactive Project at Ecoparque began to follow this historical transformational road that will take place in 3 stages, with partial launches in 2019, 2023, and 2025, and among its transformation objectives it includes incorporating these global changes. An "Animal Welfare Management" organizational hierarchy was generated and includes: veterinarians, biologists, nutritionist, and animal husbandry. These areas are in constant communication and are dedicated to focusing on interdisciplinary plans that will improve the well-being for all animals and they work in teams to reach real objectives such as transportation, medical treatment, dietary changes, training, and more.

The keeper team, along with the behavioral team, form part of "Animal Husbandry" and modifications were made in the management of animals, addition of section supervisors, and an increase in team communication and training sessions. In addition, there was an incentive to attend and presentation projects at conferences and seminars, and encouragement to participate in husbandry training and use of tools such as ZIMS.

We believe that this is the beginning of change for a future generation of keepers that understand and are convinced of the importance of good professional practices that must be used when caring for zoo and aquatic animals. It is possible for Argentina to not only count on an association that strives to professionalize keepers, but also to count on the commitment of all its facilities so that well-being for all animals continues to be the reality we are working in.

BIO

Martin Pablo Fernández Levach

I am 39 years.

In 2002 I worked as Head Keeper and Park Coordinator at the Zoological and Botanical Garden of La Plata.

In 2017 I joined the Interactive Ecopark of the City of Buenos Aires as Head Keeper.

From 2010 to 2015, I taught the course titled "Practical caregivers for animals in controlled conditions" for the General Administration of schools in the province of Buenos Aires.

Founder and Member of the Argentinean Keepers of Wild Animals Group (GACAS) from 2012 - 2015.

Secretary of the GACAS Association from June 2015 to present.

Managing Vitamin E Deficiency in Grevy's Zebra

Victoria Snook: victoriasnook@ymail.com

PORT LYMPNE RESERVE UK

Port Lympne Reserve has had a problem with vitamin E deficiency in Grevy's zebra causing us to lose the group. This talk is to explain the symptoms to look out for, share how we managed the deficiency at Port Lympne, and to raise awareness of this illness in zebra.

BIO

Victoria Snook

Victoria Snook, Senior Keeper of "African Experience" at Port Lympne Reserve and ABWAK Council member. I work on the "African Experience" which is a 140 acre mixed exhibit enclosure at Port Lympne Reserve; I have been here for just over a year. I have been a zookeeper for 14 years working at five collection Bristol, a private collection, Twycross, Marwell and now Port Lympne with a wide range of mammal species but specialising in hoof stock. I sit on the ABWAK Council as ambassador coordinator, grants committee and workshop organiser.

Plant nurseries as fundamental tools in the rehabilitation and well-being of wild fauna under human care

Malena Magari os: Magarinos@temaiken.org.ar

FUNDACI N TEMAIK N

Vegetation production areas, known as nurseries, constitute a valuable resource for modern zoos and are a fountain of endless possibilities that can contribute to the well-being of wild animals under human care.

Not only will nurseries be beneficial for those that consume the product as a part of their browse plan, but it will also be beneficial for those that use vegetation as natural shelter, visual barriers, camouflage, and more.

Having diverse types of fresh, quality browse as part of an animal's daily diet is an essential requirement to be able to rehabilitate species whose natural diet needs it, such as browsers or grazers; and not only from a nutritional point of view but also behaviorally, since it allows for natural, species specific behaviors that each individual should practice before being released back into the wild.

The achieved production undoubtedly adds importance to animal welfare allowing for natural ambiance in exhibits; animales that are brought in for rehabilitation need natural hiding areas and visual barriers will make them feel more protected; animales living in zoo exhibits will increase their welfare by improving the environment in the exhibit as well as in holding areas.

That is how the production of tree branches, pasturelands, hydroponic browse, aquatic plants, and potted browse can form the basic diet of several species that are housed in zoos and wildlife rehabilitation centers. Being able to rely on this resource will make a difference in the results obtained in the rehabilitation process and well-being of each animal present.

Species such as the marsh deer (*Blastocerus dichotomus*), howler monkey (*Alouatta caraya*), Patagonian mara (*Dolichptis patagonum*), pudu (*Pudu puda*) and capybara (*Hydrochoerus hy-*

drochaeris) are some examples of animales that are native to South America that depend on production from the nursery to achieve a nutritional balance within the institution they are at. There is not a standardized requirement for the area needed for the vegetation production. Almost any location can be dedicated to the maintenance and production of browse as long as experienced and knowledgeable staff in browse production are available.

An annual plan held at the beginning of a planting season to determine the type of browse that will be needed. The plan will establish types of seeds required, plantings, hydroponic production (very useful in reduced spaces), number of plants needed, design and use of tanks or ponds for aquatic plants, etc., all dependent on the animal species present.

This presentation's objective is to address the importance of fresh and natural browse in diets for animals that are under human care and the importance of its use during the rehabilitation of animals that will be reintroduced to the wild.

BIO

Malena Magariños

Malena Magariños. Agricultural Engineer. Graduated from Lujan National University, Argentina. Animal Nutrition degree at La Plata National University. Equines and dairy animals experience. First steps in wild animal nutrition at Temaikèn Foundation where she develops as animal nutrition and laboratory animal breeding center supervisor since 2012.

Effect of environmental enrichment on the welfare of *Puma yagouarondi* kept at Pomerode Zoo – SC, Brazil

Buhr, Gabriele; Hajenius Ach de Freitas, Renato; Hermes Maas, Claudio

Abstract

Nowadays the zoos and aquariums have been highly explored to study animal behavior, where the researchers use what they obtained from observing the individuals in captivity for conservation purposes. There is also the preserving of species in danger or next to extinction, that combined with environmental education are tools for environmental protection. However, the captive environment is different from the natural environment, with limited space and little stimuli, can lead to behavior deviations, resulting in negative consequences that harm the animal's well-being. In this case, to ensure the welfare of the captive animal, practices of environmental enrichment are performed. Those techniques provide the necessary stimuli for the psychological and physiological well-being, giving them opportunities to show the typical behavior of the specie, developing activities that explore mainly their senses. The target individuals on the study were a couple of Jaguarundis (*Puma yagouarondi*) in captivity at the Pomerode Zoo, where an ethogram of the individuals has been elaborated, analyzed and evaluated the effect of different environmental enrichment techniques to find out the possible behavioral changes on the individuals, to find out if there have been behavioral changes on the individuals. Among the enrichment techniques considered on the research, the ones addressed were: the feeding enrichment, olfactory enrichment and structural enrichment have been addressed. The animal focal method was used along with all the occurrences recorded to record the activities.

The research was split in four main phases: Phase 1 - pre-enrichment, Phase 2 - feeding enrichment, Phase 3 - olfactory enrichment and Phase 4 - structural enrichment.

It was not possible to confirm the hypothesis that the enrichment techniques used had any effect on the behavioral repertory of the individuals, but the frequency of some behaviors changed and also observing the individual's behavior variability on response to the presented stimuli.

Keywords: Captivity, Jaguarundis, *Puma yagouaroundi*, animal behavior, environmental enrichment, feline.

BIO

Gabriele Buhr

Biologist graduated from the Federal University of Santa Catarina and Technician in Environmental Control. I am currently a Responsible Technical Biologist in the Project for the Conservation of Species in Animal Science, collaborator of the Wildlife Research Group (GEAS) of UFSC and volunteer in the Project for the Desmistifying Sharks and Rays - LABITEL / UFSC. I worked as a junior management technician at the Beto Carrero Zoo and at the Pomerode Zoo as an intern in the nutrition and environmental education sector.

Environmental enrichment for various nocturnal animals!

Sergey Khlyupin: Shl11@bk.ru

Moscow Zoo

Nocturnal animals are usually hidden creatures, of which little is known, but nevertheless they are very interesting and with correct husbandry reveal the secrets of their lives. Thanks to the creation of favorable conditions and various enrichments, nocturnal mammals help us to understand them better.

In our zoo in the Primates house there is a section of the Nocturnal primates. But besides primates, other animals live there. Our collection at the moment includes: Bengal slow lori (*Nycticebus bengalensis*), Small slow lori (*Nycticebus pygmaeus*), Senegal galago (*Galago senegalensis*), thick-tailed galago (*Otolemur crassicaudatus*), Paca (*Cuniculus paca*), aardvark (*Orycteropus afer*), Greater mouse deer (*Tragulius napu*). For all animals, we try to create optimal conditions and regularly think up with the environmental enrichment.

In our lecture we will talk about special feeders for our aardvark, and also how we made an artificial termite nest, about the use of sand pool in an aardvark enclosure and its use.

For our paca, we encourage the search for food, and also offer various substrates, which he uses for the construction of his house. We also designed special houses imitating burrows in nature. For Greater mouse deer we built hideouts, and we have practice of keeping the deer with slow lori in our Southeast Asia exposition.

Senegal galagos regularly get green branches and use them in building nests, and when we renew the design in the enclosure, we took into account information about their natural habitats and we used cutted trees with a spreading crown and thin branches. Also in galagos enclosures various toys for enrichment are hunged, which slow down the eating of live food. Every day we scatter living insects to our nocturnal primates and this stimulates their hunting behavior.

For slow lori we have re-designed the cages taking into account their habitat in nature. We used cutted fruit trees, created passages from tree to tree due to sprawling crowns and increased the space due to the huge number of branches that animals regularly use. We also invented hidden areas of the enclosure for such shy animals as slow lori – it's the artificially created bamboo thickets with the use of natural materials.

For our prosimians, who have gum as one of the main components of the diet - we made special feeders from parts of fruit trees.

All information will be presented in the photo and video materials collected in our department and will be commented on.

BIO

Sergey Khlyupin

Born in 1985 in the city of Domodedovo near Moscow, Sergey Khlyupin is a Zoologist. He graduated from the Agriculture University of Moscow in 2007 as a Zoo Technician. He worked on a pig farm from 2007-2010 as an artificial insemination specialist, breeding farm animals.

From 2010-2014 Sergey worked as a criminal expert with the police.

Since 2014, he has worked at the Moscow Zoo as a keeper and currently works as in the zoo's Primate Section.

Interest include:

Sports, music, animals, and traveling.

On vacations he tries to visit wild places to see the animal behaviour in nature. He has visited national parks and wildlife reserves in different countries including Kenya, Uganda, Rwanda, Botswana, South Africa, Zambia, Madagascar, Vietnam, Indonesia, Malaysia, and Brazil.

While traveling, he also tries to visit different zoos and has had the opportunity to visit many European and Asian zoos.

Sergey has participated as a volunteer at "Save Vietnam" Wildlife Organization in Vietnam.

Red Panda bachelor group at Gaia Zoo

Lea Petersen: nzatzoo6@hotmail.com

GAIAZOO, THE NETHERLANDS

In 2016 GaiaZOO added red pandas (*Ailurus fulgens fulgens*) to the collection. Together with the Red Panda EEP coordinator in Rotterdam Zoo it was decided to house a bachelor group consisting of four males; the largest bachelor group so far. Given the solitary lifestyle of the species, the formation was a trial to evaluate the feasibility of single sex groups as a solution to surplus problems, now and in the future. Only one other zoo in Europe has had a bachelor group of red pandas. GaiaZOO received her first two males, a pair of brothers, in May 2016, added another male a month later and the last one in September 2016. The pandas are housed in a mixed

species enclosure together with Chinese muntjack (*Muntiacus reevesi*), tundra swans (*Cygnus columbianus bewickii*) and common shelducks (*Tadorna tadorna*). Behavioural studies conducted, aimed at investigating intra-group social relations, highlighted a skewed performance of social interactions, suggesting the group is not entirely compatible. Furthermore, first hints towards an objective evaluation of their personalities, the first ever for zoo-housed red pandas, and their correlation with the social interaction only further supported this claim. The implementation of a training programme supported the husbandry of the red pandas. I would like to share our experiences, good and bad with this set up.

BIO

Lea Petersen

I have been a part of the GaiaZOO family since July 2009, when I moved to the Netherlands from Denmark for my internship. When I finished my education as a zookeeper in 2010, I was lucky enough to be offered a temporary job as a keeper in GaiaZOO and eventually got a fulltime contract. My passion has always been carnivores and I feel fortunate to have landed my dream job. I take care of a large variety of carnivores like African lions, cheetahs, African painted dogs, meerkats, wolves, wolverines, Eurasian lynx, Eurasian otters, giant anteaters, bush dogs, raccoons, skunks, kusimanse, bat eared foxes, red pandas, European minks and more. Before coming to the Netherlands, I had also had a 10-month internship at Rancho Texas Park in Lanzarote, Spain.

I have a big interest in enrichment, training and conservation and try to get involved in as many conservation projects (on my department we have breeding and reintroduction programs for European hamsters, Eurasian otters and garden dormice) and fundraising as I can at our zoo. I have been lucky enough to attend the ICZ conferences in Singapore and Leipzig and I am really looking forward to this one and meeting old and new friends while learning many new things.

Assisted rearing of an orphaned common squirrel monkey at Assiniboine Park Zoo

Emily Anderson

ASSINIBOINE PARK ZOO

WINNIPEG, MANITOBA, CANADA

Abstract

Hand rearing of infant primates is uncommon in modern zoos. Hand raised primates often lack the social behaviours necessary to live in a group, reproduce and experience good wellbeing. However, situations do arise where it is necessary to for animal care staff to assist in the rearing of an infant. On December 30th, 2017 a common squirrel monkey infant (“Frank”) was born at the Assiniboine Park Zoo Winnipeg, MB, Canada. For three months, the infant was cared for by his mother, who resided in an on-display group with four other adults. Unfortunately, on March 26th, 2018 the mother had to be euthanized due to an ongoing medical issue. As Frank had been observed receiving alloparental care from the other females in the group before the passing of his mother, it was decided that an assisted rearing protocol would be put in place. Under this protocol, the infant was to remain with the group of females. Formula was offered to him in a syringe by zookeepers as a replacement for the milk he would have been receiving from his mother. Regular weighing indicated a weight gain of approximately 152g during the feeding process and weighing continued on a weekly, then monthly basis after weaning. The

lack of literature on such situations meant the feeding procedures and weaning was strongly guided by the infants weight gain and behaviour. The allomothers were also strongly protective of the infant, which affected who could be involved in the feedings and how feedings were performed. To date, Frank has displayed what we believe to be normal behaviour for a young squirrel monkey and his growth has matched that of his peers. Given our experience and results in this case, we consider our assisted rearing of an orphaned infant squirrel monkey a success. Our experience could therefore help guide facilities facing similar situations. Allowing the social group to participate in the rearing of orphan primates is possible and may help to produce physically and behaviourally healthy adults.

BIO

Emily Anderson

Emily has been working in animal care since 2010. She began her zoo career working as a summer student at a small, local zoo outside of Ottawa, Ontario, Canada. While, earning her bachelor's degree in Zoology at the University of Guelph, Guelph, Ontario, she worked and volunteered at the campus animal care facility. It was at the University of Guelph that she discovered her great interest in animal behaviour and welfare studies.

Emily went on to complete a master's degree in biology at Concordia University, Montreal, Quebec, Canada, in collaboration with the Zoo de Granby, Granby, Quebec. Through her M.Sc. program, she studied the effect of visitor presence, enclosure design and social grouping on the behaviour and welfare of zoo-housed Japanese macaques. Her article titled "Changes in dominance hierarchy of captive female Japanese macaques as a consequence of merging two previously established group" was recently published in Zoo Biology.

After completing her education, Emily spent a year travelling Eastern Canada as a bilingual presenter/animal handler for the Canadian conservation organization Earth Rangers before beginning her career at Assiniboine Park Zoo, Winnipeg, Manitoba, Canada. She has been working as a level one zookeeper in "Toucan Ridge", the tropical house at Assiniboine Park Zoo, since July 2017. In Toucan Ridge, she has had the opportunity to work with a variety of animals, including birds, new world primates and other small mammals. She is especially passionate about creating enrichment and finding ways to improve animal wellbeing.

Building enrichment workshop

Valerie J. Hare: shape@enrichment.org

THE SHAPE OF ENRICHMENT, INC., SAN JOSE, CALIFORNIA, USA.

María Florencia Presa

HEAD OF ANIMAL BEHAVIOR REA, ECOPARQUE INTERACTIVO DE LA CIUDAD DE BUENOS AIRES

Cristian Gillet

BEHAVIOURAL HUSBANDRY MANAGER, BIOPARK TEMAİK N

Abstract

Following a short introductory lecture, participants will be divided into small groups. Each group will assemble one or more enrichment devices according to building plans provided. Due to time constraints, many of the pieces will be pre-cut and/or drilled.

After the workshop, some or all of the devices will be presented to select animals at Biopark Temaikén. We will do our best to obtain photos or videos of the devices in use that we can show during a lunch or coffee break.

While the cutting and drilling will be minimal, this is an activity-based workshop. Please come prepared to work and wearing appropriate clothing.

Workshop:
Feather grafting and repair for captive and rescued birds

Andrés Capdevielle
Federico Bondone

In this workshop we will learn about:

- General considerations of when and why keepers should perform a feather graft on our captive birds.
 - Feather functions and their importance in flying and maneuvering, impulse and support potential, maneuverability and other important functions such as temperature regulation or courtship displays.
 - Tools and feathers
 - What tools we should have for feather grafting and other basic elements we can find at home.
 - Feather grafting
 - We will see various types of feather grafts, from a section replacement to a total replacement.
-

Workshop
Fauna aid in hydrocarbon leaks course

Dra Valeria Ruoppolo
Lic. Sergio Rodríguez Heredia MSc

- Marine Fauna and oil: general considerations
 - Response to emergencies (first, second and third degree response, step description)
 - Aid centers (establishment, development, needed infrastructure, general needs, etc.)
 - Marine fauna covered-with-oil handling: general handling: rescue, transport, stabilization, cleaning techniques, etc.
 - Marine fauna assistive veterinarian protocols.
 - Marine turtles and pinipeds aid and rehabilitation, general considerations
-

THURSDAY 18TH OCTOBER 2018

From Animal Welfare to Teaching Strategies: Implementing a Training Program as an Educational Approach for People with Disabilities

Authors:

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Abstract:

At Temaikèn Foundation, we understand that Conservation Biodiversity is everyone's obligation. We want to build the path for participation and inclusion for EVERYBODY by respecting differences and promoting equal opportunities.

Since its opening in 2002, Temaikèn Biopark was developed as an inclusive and accessible park. From that perspective and as a comprehensive part of its approach, we offer different services and resources for people with disabilities as well as specific activities needs.

Since 2004, the Foundation has implemented an educational program for visitors with disabilities, which are designed to complement Temaikèn's general suggestions for an educational visit, which caters to all visitor requirements.

Incorporating a teaching approach for activities and exploring sensory stimuli act as bridges to address the main contents approach. The diversity of resources implemented open up multiple access routes to reach the general objectives of the visit: to know the characteristics of different animal species, to discover their habitats, and to exchange various approaches of daily life can be applied to good environmental practices, which link how our individual actions can help protect animals and the ecosystems they inhabit.

Given these assumptions, the question that comes up is: How can those with visual disabilities have a real wild animal experience?

The answer is much simpler than imagined: Training.

And here a new challenge: How to create these experiences without having to develop new training programs?

If we consider that:

- The implementation of training programs sustained over time offers a set of behaviours already acquired in certain specimens.
- The infrastructure available to develop these programs guarantees a protected contact place, which allows a safe approach to wild animals.

It only remains to solve how to transform animal management or training designed to perform certain practices aimed at animal welfare instead of exploration and learning.

That is, how to adapt the training programs, in order to obtain the expected behaviours that allow the development of an educational activity for people with visual disabilities.

The joint effort between the Keeper Team and the Educational Department becomes an essential ingredient for this process. Joint planning from the beginning facilitates the development and implementation of these actions. The constant dialogue allows the addition of improvements and adjustments, considerably enriching the approach.

The result:

At Temaikèn Foundation more than 500 blind or low vision guest met and connected with hippos, guanacos, tapirs, pumas and various birds of prey, among other species, during the last twelve years.

Through this presentation, we want to share our experience of developing activities for people with visual disabilities to be able to approach and discover wild animals. We will communicate how we achieved, in a simple way, an ambitious educational approach, without compromising the results of solid training programs. In other words, how we generated a transformative experience built from work for animal welfare.

BIO

Eric Samb n

Member of the Education Department of Temaikèn Foundation since 2004. Since 2008, he has coordinated the proposals for People with Disabilities developed by the Foundation, including: Educational Visits, Inclusive Labor Development and Awareness Days on the subject of disability. He also coordinates the design and implementation of accessible devices at Temaikèn Biopark and the application of the Accessibility Guidelines in Tourist Services of the Ministry of Tourism of the Nation.

Juli n Esteves

In 2010 he started working at Temaikèn Animal Biopark. Throughout these 8 years he has worked with different species in various fields. These species include: howler Monkeys, colobus, tigers, cheetahs, hippos, ringed-tailed lemurs, black and white lemurs, red lemurs, alligators, yacaré caiman, tapir, and capybaras, to name a few. He has been leading one of the zookeeper sections at the biopark for 3 years.

Juan Ignacio Kabur

From his beginnings, he has always been passionate about animals. This led him to become a volunteer in the Environmental Enrichment program at the Buenos Aires zoo.

In 2011 he started studying biology at the University of Buenos Aires. From 2013 to the present day, he has worked as a zookeeper at Temaikèn Foundation, offering his knowledge and skills for the care and welfare of each of the animals in his sector.

Rehabilitation Training of an Ostrich (*Stuthrio camelus*) for a foot joint injury using therapy and magnetotherapy

Daniel Ibarrola

SPECIALIZED KEEPER AND MENTOR, TEMAIK ÈN FOUNDATION.

Fabi n Montes de Oca

SPECIALIZED KEEPER, TEMAIK ÈN FOUNDATION.

Iv n Alderete

Cecilia Fern ndez

Cristian Bravo

KEEPERS, TEMAİK N FOUNDATION.

After the diagnosis of a sprained joint (tendon and/or ligament distension) in a female ostrich, we proceeded to treat the animal.

Treatment:

Meloxicam 2 mg, 23 tablets PO every 24 hours x 3 days + Algen 60 mg, 5 tablets PO every 12 hours x 5 days.

A joint lesion in big and heavy species such as ostriches, along with their reliance on bipedalism, makes their prognosis an extremely serious situation. This made the veterinary staff rethink their treatment, adding therapeutic measures to complement treatment, and therefore avoiding an anesthetic procedure with its involved risk.

The husbandry and previous relationship between these specimens and the keepers as part of the animal management program, a program which includes training as a proactive tool for daily care of all park animals, allowed a quick reaction to this urgent case.

To perform the treatment, we used cooperative behaviours already known to the animals (stationing, target, hold, position and touch desensitization). Using the husbandry stations, we had sessions for administering oral medication (23 pills every 12 hours).

To improve treatment, in addition to the oral medication, it was decided to add hot-cold physical therapy and magnetotherapy to the affected area. These medical-veterinary behaviours consisted in teaching the animal to station in a hold position during a period of 20 minutes, a fundamental part of the treatment's success. We worked on desensitization to the presence of magnets on both sides of its legs. For thermotherapy, we trained the animals to allow contact with a thermic bag with cold water and after that, another one with hot water. In the training of these behaviours it was key to mark the bridge stimulus (whistle) at the exact moment when the animal had contact with the hot or cold surface, which allowed us to quickly incorporate these criteria to the behavior, resulting in clear communication to the animal.

After 8 weeks of daily treatment, oral medication was stopped and just thermotherapy and magnetotherapy procedures continued, resulting in the complete recovery of the animal.

It should be noted that because of husbandry and the positive relationship between these animals and the keepers, we were able to provide a quick response in an urgent and serious case resulting in desired results.

After treatment, it was decided to incorporate these useful behaviours to all running birds as a part of the proactive program of animal husbandry.

BIO

Daniel Ibarrola

My name is Daniel Ibarrola. I am a zookeeper since 2003. I am the only active keeper that had been in all TEMAİK N areas. My highest goal with animals was training the hippos. But I really consider that the real goal is teaching most of the keepers that nowadays work at the park, and being able to recognize part of my teaching in them. Since 2016 I am in Area 1 and I am at charge of the animals and its keepers.

I did not want to be a keeper since I was little, I work in many places before starting in Temaikèn, but since I am working here there is something that I love and that I will never change. Being every day with animals and looking always for their maximum welfare as possible as well as being able to teach every new keeper under my supervision, is something that makes me really happy and makes me wake up every day with a smile.

Cecilia Fernández

My name is Cecilia Fernández; I am a zookeeper since 2017. I work in area 1 in Fundación Temaiken. In this area we have antelopes (Kudu and Sable), Marsh deer, this is a very important exhibition because we tell a story of rescue and rehabilitation in the park. Bats, squirrels, zebras, meerkats, pelicans, ibis and obviously ostriches, the work we are sending.

Since I am very little I want to be a keeper, because keeping animals and looking for the maximum welfare for them is something that I love and fill up my days. I am always looking for the best for them and I learn every day from my partners and boss, so, this way, I can find the highest mental and physical welfare for them.

The importance of the role played by secondary reinforcement

Brian Valdovinos

As an animal trainer one of the most powerful things, but often little appreciated, is the use of secondary reinforcement. Perhaps due to the lack of knowledge, or ability to discover the importance of this reinforcement which when properly used can provide even more relevance to the primary reinforcement.

Traditionally, in an animal training program, primary reinforcement is the first and most valuable option. However, introducing and knowing how to train the secondary reinforcement can provide us with a range of possibilities in terms of variability, by not being predictable and increasing motivation in our animals, promoting curiosity. But, above all, it allows us to work on the duration in a number of behaviours, without the fear of losing the satiated animal's attention. Typically, the beginning of animal training depends on primary reinforcement as food, as it proves to be very effective and increases a positive association with the whole environment, however...What would happen when we train voluntary medical behaviours, which logically works while the animal is healthy, but suddenly an emergency arises and we must perform the procedure that has been trained in a real situation, because the animal is sick? And the first thing that happens with an animal when it is sick is that it stops eating, it loses its appetite.

How are we going to execute the behaviour if at all times we rely solely on food to train that behaviour?

So, in my place of work, we always try to explore reinforcement alternatives apart from food. How do we do it? Through observations, and knowing the previous history of each individual, as well as recognizing the body language of each individual and not only of the species.

Such is the case of "Chonchita" a 7-year-old Collared peccary (*Pecari tajacu*), who arrived at the zoo years ago and came from being a pet. Being social certainly helped a lot, since the barrier of fear towards humans did not exist. However, although she approached people, at the beginning we had many biting incidents towards keepers.

It is worth mentioning that the development of this case implies an excellent communication and

teamwork on part of the involved keepers and veterinarians.

The goal with “Chonchita” was to be able to perform healings and other medical procedures without the need to restricting or catching her in a handling facility or a compression cage, in a simple and completely voluntarily manner, while always having the option of choosing not to do so and having the freedom to leave.

Everything began with management inside the box, since she had a neck wound. While the cures were made, she was stroked and scratched by the neck area, and, with her body language, she showed how much she enjoyed the contact.

Because of that, it was decided to start doing management without a box. Logically making approximations in the training sessions between one management and another, in such a way that a voice command "Pegada" was introduced, and she would stick and approach the grid voluntarily, and she would be petted and have her neck scratched during several sessions or visits per day.

To reach the result, that is to be able to perform the cures, YES with protected contact, but successfully without a compression box.

The secondary reinforcement at the beginning is completely continuous, since the animal tolerates and allows cures and even injections.

The objective, as with all trained behaviours, is to be able to caress once the behaviour has finished and the result has been achieved. In addition, we would begin to space the petting, in small approximations, constantly reading the body language, reinforcing intermittently and perhaps alternating between primary and secondary. In the case of “Chonchita” she likes to be petted, but in order to have solid and lasting results, it is important to alternate with a favourite primary reinforcement.

However, it is important to mention that when caressing (secondary reinforcement), there is no risk of satiating the animal, and there is no question of exhausting reinforcement. Although within the same modality of petting, it is possible, in the best of cases, to vary to the type of caresses: vigour, speed, etc.; that little by little Chonchita’s preferences would be explored.

BIO

Brian Valdovinos

My name is Brian Silvano Valdovinos Cocom. I currently work at the Jardín Zoológico Payo Obispo in Chetumal City in Quintana Roo, Mexico. I am enrolled at the Instituto Tecnológico of Chetumal's biology program.

For the last 3 years I have actively participated in various courses and conferences that have helped me evolve and I have applied the knowledge I have learned at the institution where I work. I have also been able to share this knowledge with my fellow keepers and keepers from other states that have participated in courses available in my country.

My current achievements, my desire to learn and the desire to share my experiences with my coworkers gave me the opportunity to become a part of the animal welfare department that was created for the first time at my zoo. Last month, I went from being a keeper in charge of the felid area to being in charge of the flora and fauna areas of my institution, which includes being in charge of the entire keeper group.

I currently form part of the board for the Mexico Keepers Association which we started organizing in October of 2016 at the XXXIII AZCARM Conference (Association of Zoos, Breeders, and Aquariums of Mexico). I have attended various courses such as the 1st Husbandry for Captive Wildlife Conference that took place in 2015 at the Zacango Zoological Park, the “Animal Welfare, Medicine and Husbandry for Zoo and Marine Animals” course that took place in 2016 in Leon, Guanajuato, and the “XXXIII AZCARM Conference” in Veracruz in October of 2016. I presented at the 1st Keeper Conference in Mexico with “Conditioning Pain, A Step by Step Preparation of Important Medical Behav-

iors” held in Guadalajara, Jalisco, during the XXXIV AZCARM Conference in 2017. I attended the 13th International Conference on Environmental Enrichment” at the Jaime Duque Park in Bogota, Columbia, where I was certified by The Shape of Enrichment during an intensive environmental enrichment course. Thanks to my experience with operant conditioning in felids, I was able to participate as an organizer and presenter during the 1st Basic Husbandry for Wildlife Under Human Care course held in my home town. I have mainly focused on animal welfare topics that deal with operant conditioning.

I am enormously happy to be able to participate at this conference and that you have allowed me to share my experiences in conditioning with my presentation “The Important Role that Secondary Reinforcements Play.”

South American Sea Lions (*Otaria flavescens*) at the São Paulo Zoo: a review of its pioneer husbandry in Brazil

Igor Renato dos Santos Horta: renatoigorgo@gmail.com

ZOOKEEPER AT THE SÃO PAULO ZOO, MAMMAL DEPARTMENT

The following research is about to present data and share information about the husbandry of South American Sea Lions (*Otaria flavescens*) under human care at the São Paulo Zoo, and create a discussion about the current status of marine mammal species under human care in Brazil that were in exposure to the public. Information about marine mammal husbandry at zoological gardens in Brazil are quite rare, and it's a curious fact that one continental country who receives several species of aquatic mammals such as Brazil, does not present many studies about the welfare under captivity of some families that occur frequently at zoologies around the world, such as Otariidae. Composed by sea lions and fur seals, the family Otariidae counts with seven genus and fourteen species, being that three species are most reported in Brazil: *Otaria flavescens*, *Arctocephalus tropicalis*, and *Arctocephalus australis*, and even so the Brazilian coast does not shelter fixed colonies of these animals, groups of otariids may be found since the territory of the state of Rio Grande do Sul, in any season of the year, until Bahia, generally at the coldest months (PINEDO et al., 1992; SIMÕES-LOPES & XIMENEZ, 1993; VENSON, 2001; BARBIERI, 2004). In more than a hundred years of zoological experience in Brazil, the first successful husbandry of South American Sea Lions (*Otaria flavescens*) in Brazilian territory occurred only at the year of 2001, inside the São Paulo Zoo, and the historic of this pioneer work becomes fundamental in future discussions about the maintenance in captivity, welfare, behavior, and conservation of this group of mammals in Brazil.

BIO

Igor R.S. Horta

Natural of Santos, São Paulo Brazil, works as Zookeeper of the São Paulo Zoo Mammal Department, specifically with South American Sea Lion (*Otaria flavescens*), Maned Wolf (*Chrysocyon brachyurus*), Lesser Anteater (*Tamandua tetradactyla*) and Neotropical Otter (*Lontra longicaudis*) since October 2017. Currently studying veterinary medicine in São Paulo, became passionate with zookeeping during the time that worked for 2 years in São Vicente Zoo, and saw the importance of this function, especially for wild animal's welfare in captivity and how it can help vets routine at caring of such fascinating animals. Interested in welfare, conservation ex-situ and in-situ, husbandry, training, presentations, education.

Diet change leads to intensified plumage pigmentation and major breeding improvement the Scarlet Ibis (*Eudocimus ruber*) at the Jurong Bird Park

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JUNIOR KEEPER

Dr Francis Cabana

ASSISTANT DIRECTOR

JURONG BIRD PARK, JURONG HILL SINGAPORE

Abstract

In the wild, scarlet ibises (*Eudocimus ruber*) have a distinct bright red plumage that is hard to maintain under human care due to their highly specific diet that is not readily available. Scarlet ibises are easily maintained in zoos, but pose a challenge in reaching optimum husbandry, diet and welfare as conditions in the wild can rarely be replicated. The bright red plumage of scarlet ibises often fades into pink when in captivity, which was the case for Jurong Bird Park (JBP). Not only did the scarlet ibises in JBP have a faint pink plumage, they also experienced extremely low breeding success between 2016 and 2017. Even though they were being fed a standard diet of ibis pellets, fish and krill, they were not receiving an optimal balance of nutrients to give them their bright red plumage and in turn induce a strong breeding season. Thus, in this project we aimed to (1) correct the pigmentation of their plumage and (2) increase breeding success by simulating a breeding season. The intensity of the scarlet ibises' bright red plumage is vital during breeding season as it helps to attract possible mates. The lack of specific nutrients within the diet could have caused the plumage to be faint which in turn affected the breeding season, as the birds were not at their best. Their diet and husbandry were altered to improve the pigmentation of their plumage and ultimately simulate a breeding season. At the JBP, there are 162 scarlet ibises housed together with other water birds such as the straw-necked ibis (*Threskiornis spinicollis*), white ibis (*Eudocimus albus*), waldrapp ibis (*Geronticus eremita*) and roseate spoonbills (*Platalea ajaja*). Diet and husbandry of scarlet ibises within three aviaries were altered. This included testing out a plethora of nesting materials to identify what they preferred and different combinations of a new ibis pellets and fish. Given various options such as nest baskets, platforms and trees, the majority of scarlet ibises chose to nest at tree forks. The amount and type of nesting material given seemed to play a contributing role in the success of the breeding season as they were able build bigger and more stable nests. Nesting materials such as ferns, twigs, Chinese bamboo, *Imperata cylindrica*, *Baphia nitida*, *Fagraea fragrans*, hibiscus and fir twigs were given. The nesting material preference and diet intake of the scarlet ibises changed throughout the various stages of a breeding season, with them preferring larger branchy twigs at the start and softer leafy material later on. A diet 4% higher in crude fat than recommendations was the most efficient in launching a breeding season, while a diet 5% higher in crude protein led to higher chick survivability. This suggested the need to change the husbandry as the season progressed. The increase in canthaxanthin concentration was not efficient in intensifying the plumage. A mixture of 40 mg/kg of canthaxanthine, 6 mg/kg of beta-carotene and various other types of carotenoids from spirulina, shrimp and corn were successful. The scarlet ibises showcased a drastic change in plumage pigmentation from faint pink to bright scarlet and led to a seventeen time increase in breeding success with thirty-four hatchings recorded from January to May 2018 as opposed to two in 2017 and none in 2016.

BIO

Aaarti Tiakarajah

I am Aaarti Tiakarajah, a Junior Keeper from WRS Jurong Bird Park. I have been working here as a part timer for 2.5 years and a full timer for 1 year. During these years I have moved around and worked with various avian species although I focus mainly on wetlands birds now. I enjoy the challenge of breeding and improving welfare conditions of the birds under my care. The Waldrapp Ibis, Straw necked Ibis and Shoebills have gained my interest due to the obstacles faced in breeding them.

Oh Caecilian (on the music of Simon and Garfunkel 😊)

Ben Van Dyck: Benny.vandyck@kmda.org

ZOO PLANCKENDAEL

Abstract

Caecilians are amphibians and make up an order which counts more than 200 discovered and described species until now (and dozens of undescribed species) and they are spread throughout the world in the continents Asia, Africa and South-America. You'll find caecilians in all kinds of lengths and weights and start at 9 centimeters to be the smallest and can become as big as 2.4 meter. A quarter of the described species are oviparous or egg-laying (which means they have a kind of breeding behavior with an exception now and then), the other 75 % are viviparous which means they give birth to already living offspring which start immediately feeding after birth with small living organism. Caecilians are both aquatic as terrestrial .All caecilians are carnivorous and most of them need living food. The name caecilian comes from the Latin *caecus* which means "blind" , most of the species of caecilians have very small or non-functional eyes , they're even species where the eyes have completely disappeared instead they have just above the place where the eyes should be small antenna so vibration is very important for them. They feel their food. This makes caecilians a challenge to keep in zoos with kids knocking on the windows of their cages but I have the solution 😊.

Caecilians have a fascinating behavior- and breeding system, for instance the females of *Boulengerula taitana* will develop an extra outer layer of skin to feed her offspring for the first days or the aquatic species of *Typhlonectes spp* are born with gigantic external gills which explode just after birth. Or what about the species *Caecilia thompsoni* from Mexico with a length that can be as tall as 2.4 meters a real Jurassic Park monster. There're species whom make beautiful breeding rooms to lay their eggs in and have a really breeding behavior and other species just drop their eggs around like Easter eggs. And don't forget the color not all caecilians are pink like or blackish but you've also beautiful brown, and yellow and what do you think about fluorine purple a real "Prince" in the family. Because of their strange wormlike appearance not many people will recognize caecilians as amphibians but they're and I'll will explain why.

In this presentation I'll show you a few different examples of keeping caecilians trough my own experience with more than 30 species in my own and the Antwerp Zoo collection in 101 pictures, movies and more 😊. This incredible interesting group of amphibians should have his place in every zoo in the world and are a low cost species to keep but a high-profit species

in the education, scientific and conservation perspective. With showing a few examples of our own experience I'll show you how you can make caecilians display-worthy without attacking their welfare. I'll bring you in a fairy tale the fascinating world of feeding, husbandry, display, sexing, breeding and Loving caecilians. Also scientific are caecilians an open world to discover with a great opportunity for your own scientific department, a world of the unknown with many interesting insights and developments to discover. The aim of this presentation is to get as many zookeepers as possible interested in this wonderful group of amphibians and to start a caecilian zookeepers interest group so they can lobby in their zoo to keep at least 1 caecilian species, with all the necessary information and the words "low-cost" and "high-profit" every director is prepared to listen to keep this species.

BIO

Ben Van Dyck

1.0 Homo sapiens Ben has 0.3 offspring ages 27, 19 and 14. He was first paired to 0.1 E with which he had one offspring 0.1, which was sent to the UK by the studbook keeper and afterwards Ben was introduced to 0.1 G who give birth to 0.2, now he is with a non-breeding female. He was born and raised in Belgium as the youngest of 4.2, he grew up in the countryside where his father was a farmer with 300 animals of 8 species and 30 hectares of cultivated land full of vegetables and fruits. Ben's father was one of the first ecological farmers who breed everything biologically (even his kids). Ben joined the boy scouts at 5 years old, where his passion for nature became bigger and bigger. At age 7 he was the youngest member of the Flemish Nature and Conservation Study-group where his passion for reptiles and amphibians started. At age 12 he started his OWN zoo which included llamas, different species of squirrels, mice and other rodents, donkeys and more than 200 tanks of reptiles, amphibians and insects. There wasn't a masterplan because entrance was free, there wasn't a souvenir shop nor a restaurant but there was a lot of passion. At 14 he discovered beer and girls, but these always took second place. Well let's say beer 2nd and girls 3rd 😊. Since his youth he also collected books on animals and zoos. His library contains more than 10,000 books and yes, he has read them all (almost). When he turned 18, he had still his 200 tanks full of frogs, salamanders, beetles and caecilians. He started college at the Higher Film Institute Brussels, because there weren't any courses for zookeepers in Belgium. Ben wanted to be the new Hugo Van Lawick, or Attenborough, or Marc Sleen (a local comic writer and safari film maker). While in college, he kept his reptiles and amphibians and in his spare time he visited zoos (by this time, over 840). After graduating, he went to the zoo to ask for a job and that is how he began his career 28 years ago at the Antwerp Zoo (it was so easy back then guys...). He worked in many areas (nocturnal, big cats, great apes and other primates and his beloved reptiles and amphibians) before going to the sister park Planckendael, where he became Head Keeper for elephants, giraffes, rhinos and hoofstock.

Although he keeps busy with amphibians and reptiles during his free time, along with several co-workers from Holland, he organizes the yearly Cold-Blooded Workshop for The Harpij and give lectures about elephants to raise money for the Herpes Fund, and about amphibians to raise funds for research on the amphibian chytrid. Ben also worked in Madagascar, Vietnam and Malaysia and hopes that when he retires, to be able to immigrate to a beautiful country somewhere in Africa so he can do something with animals 😊😊.

Management of a mixed species exhibit WITH OUT rotation, at Emirates Park Zoo

Henry Kayondo

SUPERVISOR HOOF STOCK DEPARTMENT, EMIRATES PARK ZOO.

UNITED ARAB EMIRATES (UAE)

Because in the wild animals stay together in harmony, this coexistence is being introduced by captive wildlife husbandry practices through using mixed specie enclosures or exhibits howev-

er, managing a Mixed enclosure exhibit is one of the most common challenges that is faced by organizations carrying out wildlife husbandry all over the world and these may include Zoos, Sanctuaries, Rescue and Rehabilitation Centers.

Emirates Park Zoo has got one of the most successful mixed species enclosures called the Giraffe Park with an area of 1712.78 m² and this area is housing Three female Giraffes, seven Rhim Gazelle, Two Ostriches, 19 Guinea fowls, seven Fallow Deer's, Two Zebras and three Crowned Cranes. All these animals do exist in harmony and there is breeding success of some individual species. Being a mixed specie enclosure one expects many challenges that have to be addressed if coexistence is to take place and this is done by the provision of minimum requirements needed by individual species in this environment BUT still one has to put in mind that all species have to share most of the ecological requirements, so we achieved it as follows; We made sure that this enclosure is large enough to cater for different specie distances like their contact distance, Flight distance and social distance and if any of these distances were compromised, then coexistence would cease to exist. Of more importance still we made sure that these mixed specie animals have relating habitats and relating mode of feeding behaviors in this way we had herbivores that include browsers/arboreal and grazers, all together diurnals. As a good management strategy we made sure that all individuals that were to be introduced would almost be of similar age group together with same methods of socialization that is to say if there was to be hierarchism through acquiring dominancy, then this would reduce the potential for dominant interaction from the larger species that is if there was chance to create inter-specific rank order within the enclosure.

Inter-specie resource competition control; as a mixed enclosure exhibit we all expect to get competition for resources like food, water and breeding/ mothering areas, shelter. Here all these were catered for as follows; with food we provided multiple feeders and feeding points and we managed to control successful free feeding of Ostriches that had been so challenging because of the giraffes that were reaching every feeding point of our Ostriches. Multiple Drinking Water points were also provided that catered for different animal heights then with breeding/mothering areas we provided multiple breeding areas for each animal that could give birth or hatch its eggs and if mothering was becoming a challenge we would isolate the mother together with its neonate for proper parental care.

Conclusion; A mixed specie enclosure is the best way to keep most of our zoo animals because if we are to relate with what happens in the wild these animals do not live separately, there is always "coexistence".

Thank you.

BIO

Henry Kayondo

I am by names Henry Kayondo, a Ugandan by nationality; I hold a Degree in Biomedical Laboratory Technology under the faculty of veterinary medicine (Makerere University) majored in biomedical parasitology, biomedical microbiology, principals of epidemiology and disease prevention in animals among others.

I also hold a Diploma in wildlife and allied natural resource management and this involves management of captive wildlife, Ornithology, Mammalogy, principals of ecology, use of ZIMs (Zoological Information Management System) software as an online database of wild animals under human care by "360 species Organization".

I also hold a Diploma in secondary Education with only two year working experience as a secondary teacher this field has equipped me with good communication skills, professional code of conduct, leadership skills among

others.

I have worked with Uganda Wildlife Education center (UWEC ZOO) as a zoo keeper for seven years also in zoos of Japan as a trainee during the exchange program held by JICA (Japan International Cooperation Agency) and among them include; Yokohama zoo, Zoorasia, Saitama zoo and lastly Kanazawa zoo.

I was also one of only Two zoo keepers from African continent that attended the 5th International Congress on Zoo Keeping and this was held in 2015 Leipzig zoo in Germany. And this gave me exposure to many professional zookeepers internationally that am always in touch with in many zoo related issues and most of all I would like to thank ICZ 2015 for determining my current job now, working with Emirates Park Zoo (UAE) as a supervisor Hoof Stock Department for two years. After the last ICZ 2015 congress my profession life changed greatly.

Training an adult drill male - in Germany and Cameroon

Kathrin Paulsen: kathrin_paulsen@web.de

ASSISTANT HEAD KEEPER, PRIMATES, HANOVER ZOO, GERMANY
CHAIRWOMAN "SAVE THE DRILL"

The drill (*Mandrillus leucophaeus*) is one of the most endangered primates in Africa.

There are approx.3000 individuals left in the wild additional around 650 in sanctuaries.

In zoos, you'll find around 90 individuals worldwide - so it is very important to save each one to keep the population in zoos alive.

We all train animals every day! Training is integral. The animals must know to how move between enclosures in order clean their cages for example. Through training the animals learn rules and daily routines. But what happens when it is immediately essential for a monkey to be trained to survive? When suddenly there is an outbreak of a disease that makes a daily injection or tests of urine necessary? New training needs to be implemented.

Two cases will be presented, one in Germany, one in Cameroon. The first animal is from Hannover zoo, regarding a male drill of 12 years old that lost 10kg in a few weeks – almost one third of his total weight!

The second male is from Cameroon, from the Limbe Wildlife Centre (LWC). As chairwoman of the German association "save the drill" who support Drills in the world, in 2016 I went to the LWC, an education and rehabilitation centre in Cameroon, for two weeks. There was a male Drill of 16 years old started to have sign of diabetes in March 2015 and lost more than 10kg in 4 months.

I will present on how to train them not only for daily injections but also on how take samples of urine to monitor the glucose level.

The goal of this training was to be able to send them back to their groups so they can have as normal a life as possible, whilst also being able to give daily injections and take daily samples. For the male in Germany we succeeded to send him back and he lived for more than six years as the alpha male and also had lot of offspring. For the second male, he is not yet with the group because the colony consists of more than 80 drills, but he is living next to them with a small group for now. He is still in the process of adapting of his new life.

BIO

Kathrin Paulsen

Hannover Zoo Germany,

Chairwoman "Save the drill"

I've been working in the primate section of Hannover Zoo, Germany for the past 25 years.

In 2007 I was promoted to the position of Vice head keeper, responsible for monkeys and apes.

I have also passed the Zoo-keeper Trainer course, which means that I am qualified to work with trainees during their apprenticeship in the primate section.

*I've specialized in non-human primates, particularly in drills (*Mandrillus leucophaeus*).*

In my free time, I work as the chairperson of the German association "Save the drill".

Our goal is the promotion and preservation of drills in their natural environment in Nigeria and Cameroon.

Design and implementation of an operant conditioning program for the husbandry of common zebra (*Equus quagga*) in Buin Zoo, Chile.

Idalsoaga Ferre, Esteban M.

González-Rivero, María F.

Erices Fuentes, Pedro

One of the most important tools for veterinary care and animal welfare in a zoological collection is preventative medicine, which most of the time includes routine animal handling, administration of medication, or taking samples.

In the particular case of zebras, their nervous, non-docile, and sometimes aggressive behavior makes them difficult to handle, especially when it comes to preventive protocols where they can reach certain levels of stress due to the procedures. The objective of this project was to develop an operant conditioning program for clinical and health handling of common zebra (*Equus quagga*) in the Buin Zoo collection, in Chile.

To carry out this project, they used two males, which were 4 and 6 years old, which were worked isolated from each other and at different times.

An operant conditioning protocol was established, based on positive reinforcement and protective contact to ensure staff safety.

A criteria of progress was defined with the final goal of blood extraction with full collaboration by the specimen.

The conditioning program's goal was effectively achieved, with blood extraction in one of the two specimens and desensitization in the other.

In conclusion, an operant conditioning program is a really important tool that helps make routine medical procedures practical and fast and decreases the stress levels in animals during these procedures.

Key words: operant conditioning, clinical management, common zebra.

BIO

Esteban M. Idalsoaga Ferre

Esteban began his professional career in 2003 as the manager of the neonatal assisted hand-rearing area for mammals and birds at the Zoological Park Buin Zoo, in Chile.

A few years later he dedicated himself to training small parrots until becoming a trainer and training supervisor for various birds and mammals, focusing on training for preventive medical procedures.

Since 2012 he has been in charge of the Animal Welfare department at the Buin Zoo, training education guides and ensuring that exhibits have an educational message.

In March he became a member of K9 Solutions, an organization that uses trained dogs for search and rescue events.

Neuroeducation and animal ambassadors: applied sciences to new educational experiences

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Section:

Education: connecting to our audience

Abstract:

Temaikèn Foundation was born with the mission of protecting nature. To achieve this, they develop environmental education programs, wildlife and ecosystem research, and species conservation programs, prioritizing native species.

In Temaikèn Biopark, we develop programs about education, outreach and awareness promoting the protection and conservation of biodiversity. There, schools and educational institutions with different levels and modalities share an amazing experience with guides, keeper and teachers. About 115.000 students participate in educational visits in the Biopark per year.

In this way, we offer a trip through nature where participants walk the biopark in a unique and different way, converting the educational visit into a transforming explorative and reflective experience. In 2016, we have developed two new different projects, which complement the educational visits: Biologists in action and Ecochicos (Ecokids).

These projects plan to follow along with students from the 4th, 5th and 6th grades of Primary through the Biopark linking specific contents of natural science and the animal's world, based on the country's curricular design. The general objectives are:

- To learn the animal world: compare the key characteristics that distinguish the different groups.
- Identify the relationship of living creatures with the environment.
- Establish the relationship between humans, environmental modifications and their issues.
- Recognize the importance of conserving nature.

They are designed with a beginning, progression and ending, so that the students can experience a sense of oneness. Along the way, the guides use different teaching strategies to promote learning applications, which allow to them achieve their objectives. Some of these are observation, direct experiences, hypotheses formulation, group reflection, and the exploration of bio

elements, among others.

We now understand, thanks to advances in neuroscience and neuroeducation, how the brain works, and the fundamental role of curiosity and emotion in the learning progress. It has been scientifically proven that the acquisition of knowledge, wherever, in classroom or in life, is not achieved only by memorizing or repeating over and over again, but also by doing, experimenting and moving. Learning is a progress that is related to the changes in an individual by neuronal, cognitive and behavioural levels, as a result of experience, allowing their adaptation to the environment. For that reason, we have decided to include a direct experience with keepers and ambassador animals. Approaching animals that are under human care allows curiosity, amazement, surprise and enthusiasm to be generated and therefore an interest to know more about the animal world.

In this way, we produce an area for students to explore which permits learning of the proposed contents. To this end, the work between the Keepers Department, the Education Department and Visitor Care is essential to develop and facilitate each of the planned activities and incorporate necessary improvements and adjustments. Through this oral presentation, we want to share this joint effort that allow us to provide an enriching experience for new educational experiences.

BIO

María de los Angeles Sardou

*Education Department, Temaikèn Foundation
Argentina*

Passionate about nature, biology teacher by profession and vocational scenic artist, she always had a passion and an interest in the native biodiversity of the places she visited. In 2007, she became an Educational Guide to the Biopark and today she is an Environmental Education Specialist and a leader in educational development in the Temaikèn Foundation's Educational Department.

During her free time, she teaches Biology at the Municipal Higher Institute of Teaching and Technical Education No. 8034, training technicians in Environmental Management and Health.

Among her duties, within the Educational Department of the Foundation, is the creation of experiences in Nature through the planning, development and implementation of Educational Visits, training for educational and recreational guides, and for teachers of all levels in environmental issues, co-coordinate the "Festival ConCiencia Activa" for schools and civil organizations throughout the country, develop a variety of teaching resources, carry out the virtual course "Environmental Education, an education for action" and many other transformative experiences that inspire others to protect together nature.

Pablo Dovico

*Keepers Department, Temaikèn Foundation
Argentina*

My story in the Temaikèn Foundation began at CRET (Species Rehabilitation Centre), where I started to become familiar with and understand animal care with very experienced people. Soon after I joined the team of zookeepers of the "Lugar de las Aves", a place that marked my life and career. We had the opportunity to present papers in national and international congresses and I won a professional course in "Bird welfare and conservation" from AZA (Association of Zoos & Aquariums). Today I am the tutor of the "Lugar de la Aves" team and I have finished my university career, being currently a Technician in Conservation and management of Biodiversity.

Juan Ignacio Kabur

*Keepers Department, Temaikèn Foundation
Argentina*

From the start he was always passionate about animals, this led him to become a volunteer in Environmental Enrichment in the zoo of Buenos Aires.

In 2011 he started a Degree in Biology at the University of Buenos Aires and from 2013 to the present he has been working as a keeper at Temaikèn Foundation, offering all of his knowledge for the care and welfare of each of the animals in his sector.

Presentation about ICZ 2021

Joanne Richardson

Conference Close & Summary

Liz Romer

1st Reserve

Husbandry of Oriental white ibis (*Threskiornis melanocephalus*) at Opel-Zoo Kronberg (Germany)

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M.SC. BIOLOGY, TRAINEE

J rg Beckmann

M.SC. BIOLOGY, CURATOR

The Oriental white ibis (OWI) is a medium sized, white coloured and black-headed ibis that forms a superspecies with the African sacred ibis (*T. aethiopicus*) and the Australian white ibis (*T. molucca*). It inhabits coastal wetlands and lowlands (occasionally up to 950 m) in large parts of Asia (China, Pakistan, Nepal, India, Sri Lanka...). Currently, the population of OWI is estimated to be smaller than 20,000 mature individuals which equates 15,000 - 30,000 individuals in total. Population numbers seem to decrease moderately rapid due to disturbance at breeding colonies, drainage and agricultural conversion, hunting and egg collection. In Vietnam and Cambodia, the formerly abundant OWI is now scarce and only locally distributed (BirdLife International, 2016). Hence, the OWI is listed as “Near Threatened” by the IUCN.

Despite the Red List category of the OWI the species is rarely kept and bred in zoos (24 institutions in Asia keeping about 500 individuals and only ten institutions outside of Asia keeping about 100 individuals; ZIMS on 13th September 2018), while the unthreatened sacred ibis is kept quite regularly (167 institutions worldwide keeping about 1,600 individuals; ZIMS on 13th September 2018). In Opel-Zoo Kronberg we keep and breed OWI since 1982. Altogether, a minimum of 102 OWI hatched and at least 78 individuals survived the first 30 days.

Until 2007, we kept OWI in a shady 10 m x 6 m x 5 m (length x width x height) aviary with straw necked ibis (*T. spinicollis*, 1982-2002) and scarlet ibis (*Eudocimus ruber*, 2002-2007).

Since 2008, our OWI inhabit a large walk-through aviary (43 m x 33 m x 12.5 m) that they share with black storks (*Ciconia nigra*), Northern bald ibis (*Geronticus eremita*), glossy ibis (*Plegadis falcinellus*) and several species of European ducks. In both aviaries, birds have access to a low heated stable. In the walk-through aviary different trees, especially one old oak (*Quercus robur*), offer elevated resting and sleeping sites above ground frost level as well as sunny spots throughout the day. Besides the trees, several artificial canopied nesting platforms are available to the birds (see Kauffels 2010 for a more detailed description of the aviary). However, for nesting OWI only accept a group of willows (*Salix spec.*) that grows close to and on a small island.

To increase breeding success and promote health and welfare, we changed the diet offered to our OWI repeatedly (see Beckmann et al. 2015 for more detailed information on feeding plans). Since 2014, we feed a doughy mix of chopped freshwater fish (round goby (*Neogobius melanostomus*), common roach (*Rutilus rutilus*), rainbow trout (*Oncorhynchus mykiss*) and European cisco (*Coregonus albula*)), mice, day old chicken, minced beef, low-fat curd and mealworms (larvae of *Tenebrio molitor*) twice a day and offer ibis pellets (Ibis Floating by Wisbroek) in separate bowls. Because all our ibis species breed more successfully since 2014 (five to eleven chicks of OWI surviving the first 30 days each year) and plumage tidiness improved visibly, we keep this recipe until now.

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Presentado por:

Miriam Göbel (M.Sc. Biology, en formación) & Jörg Beckmann (M.Sc. Biology, conservador)

BIO

Miriam Göbel

Miriam Göbel received her Bachelor of Science in Biology from the Johannes Gutenberg-University Mainz, in Mainz, Germany, with a thesis entitled "Investigation of the Influence of feeding Enrichment on the Behavior of Aye-Ayes (Daubentonia madagascariensis) at the Frankfurt Zoo."

Miriam also received a Master of Science in Ecology and Evolution from Johann Wolfgang Goethe-University Frankfurt am main, in Frankfurt am Main, Germany, with her thesis on "Ecological Studies on the Primates in Área de Conservación Privada Panguana."

In 2017, she volunteered at the ACP Panguana Station in Huánuco, Peru, a private reserve and biological research station, where she organized a field course for Peruvian biology students titled "Methods of the investigation of diversity of the fauna and its biological interactions".

Miriam Göbel has been a Training Curator at von Opel Hessische Zoostiftung, in Kronberg, Germany, since January of 2018.

2nd Reserve

Evolution of an Orang Utan Building- a changing orang utan exhibit at Apenheul

Tijs Swennenhuis

BIO

Tijs Swennenhuis

I'm a zookeeper from Apenheul.

Now I primary work with squirrel monkeys, black and gold howlers, yellow breasted capuchin monkeys, Javan langurs and orangutans. But I worked with all the primates and non-primates that we have in the park.

My presentation will go about our Orang utan building, how and with what idea we built it, what we have changed in the past few years and why. And a little bit about future dreams what do we want and what do we think about in the future, especially when you are keeping Orangutans.

POSTER ABSTRACTS

Animal Welfare – a foreign concept?

Sarah Blake

“Conservation, education, research” is our mantra. Why isn’t welfare on that list? The best welfare standards possible are what we strive for with our own charges but what about the places that don’t understand welfare as a concept? How can we help them? I went out to Vietnam and did just that.

I spent 3 months as an animal welfare advisor in conjunction with Animals Asia, Wild Welfare and the Yorkshire Wildlife Park Foundation charities. Together we instructed keepers on better practices, taught them training techniques, experimented with enrichment designs and worked hard to get the keepers thinking about animal welfare in the same way that we do.

I would like to encourage keepers to do something similar. Imagine if we twinned each zoo in the developed world with one in a developing country. How much change could we make to animal welfare as a whole and for individual animals that need our expertise right now.

It’s not easy, but it’s possible.

There were failures, successes, frustrations, an awkward marriage proposal and the determination to make a difference. The difficulties of language barriers were huge and I had to be sensitive to a culture I had never experienced before. But together with the keepers and external parties the zoo made changes for the better and continues to do so with the help of others.

Hanoi zoo is seen as a leading example by Asian standards therefore by creating changes here we can influence other collections throughout the country and hopefully beyond.

A journey of integrating orphaned-infant chimpanzees (*Pan troglodytes*) into the social group of Ngamba Island Chimpanzee Sanctuary in Uganda

Byron Ssembo

Chimpanzees alongside other African great apes are endangered and if nothing is done they may soon be driven to extinction. The drivers for extinction are anthropogenic causes, such as habitat loss, bush meat and the illegal pet trade.

Chimpanzee Trust, a non-government organization that manages Ngamba Island Chimpanzee Sanctuary, offers long term care of orphaned chimpanzees which have been confiscated and have not had a chance to be re-introduced to the wild. However, one of the challenges of this care is integration of new orphaned infants into the existing sanctuary chimpanzee community. The sanctuary overcomes this challenge through a comprehensive integration program which each orphaned infant at the sanctuary has gone through.

Integration involves introducing the orphaned infants to few experienced adult females with motherly behaviours as identified by the keepers first to become surrogate mothers and develop

a mother–infant-like bond relationship. This relationship often involves nest-sharing, carrying, and intervening to reduce risk to the infant.

After keepers are confident enough, gradually they introduce the orphaned infant chimpanzees into age/sex diversified social group at Ngamba Island Chimpanzee Sanctuary and continuous observations are made up to the final stages of the integration, when the infants are fully integrated and accepted by all the resident chimpanzee community members.

The surrogate mothers that initially show maternal interest in caring for the infants continue to maintain the bond with the infants for up to about 10 years. As a result of the comprehensive integration program chimpanzees that arrived at the sanctuary as orphaned infants have successfully integrated and gradually familiarized with each other in the social group, and thus engage in positive social interaction to strengthen their bond.

With the increasing human activities and ultimate reduction in chimpanzee habitats, it is increasingly becoming inevitable to open up sanctuaries and zoos to care for the homeless species and therefore understanding the integration process is essential if we are to have a successful rescue and rehabilitation of the endangered species.

Determination of ectoparasites in *Hydrochoerus hydrochaeris* at piedemonte Araucano

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Ectoparasites are one of the main problems among wild and domestic animals causing developmental issues and weight loss, due to stress, which causes them to eat less. Depending on the degree of infection, the different ectoparasites can even cause anemia or transmit pathogens like *Anaplasma spp*, *Babesia spp* or *Trypanosomas spp*. This is especially true in neonatal animals, where the lack of information available complicates the development of programs to control the parasites. In the Orinoquia region in Colombia, lives a key specie, the “chigüiro” (*Hydrochoerus hydrochaeris*), a species that is important in its ecosystem. It preys upon native predators like (*Panthera onca*) and (*Eunectes murinus*) and its urine contains great quantities of nitrogen that enrich the soil. “Chigüiros” have adapted and distributed across flooding savannahs and valleys where the climate differs extremely during the summer with extensive droughts and winters with long flooding periods, which cause illnesses and infections.

Since there are not any studies regarding ectoparasites in “chigüiros” in Arauca, it’s become necessary to determine and recognize the different types. To do so, a group with approximately 45 individuals of different ages was located in the area (El Encanto estate in la Providencia, Fortul-Arauca). The fence around the estate does not limit the movement of the animals so they cohabitate with other species (cattle, poultry and wild species).

For 4 months during the summer, samples were periodically collected and stored in sterile

containers with 96% alcohol then taken to the Universidad Cooperativa de Colombia, Arauca campus, where they were analysed and identified. Among the other ectoparasites collected, there were 240 *Amblyomma* ticks (168 of them *Amblyomma cajennense* which represents a 43,8% of the total; 72 *Amblyomma maculatum* representing 18,46%), 86 *Hirudo sp* (22,05%), 53 *Culicoides sp* (13,59%), 11 *Tabanus sp* (2,82%) and mites like *Eutrombicola sp*.

Animal conservation is a mechanism that maintains species as time goes by, that is the reason why having real data about the pathogens in each region makes it easier to establish controls and eradication protocols and protect native species like *Cuniculus paca*, *Pecari tajacu*, *tayassu pecari*, *Tapirus terrestris*, *Puma concolor*, *Dyasipus sanabicola* that are important to maintain the different ecosystems and are endangered due to the habitat loss and indiscriminate hunting in some areas in the country.

There were no *Rhipicephalus boophilus microplus* infections even though they are often found in bovines and canines. Both species that are in direct contact with the “chigüiros”.

Improvements in daily care of cheetahs

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The objective of this work is to narrate the actions taken to improve the welfare of the old cheetahs living in Temaikèn by means of environmental modifications and new management protocols designed to fit the needs of said individuals.

This list collects the environmental modifications made according to the individual motor limitations:

- Placing of a ramp to access the upper bed: to facilitate the access to the resting area.
- Heating: to minimize the impact of cool winter temperatures.
- Addition of soft substratum: both in the bed and the ground so that the animal can choose.
- Shelter: so that the animals can choose whether or not they want to be seen by the visitors.
- Vegetation: as another type of shelter and potential defecation areas.

Training plan

With voluntary blood sampling, vaccination and weighting behaviours already learned and considering the clinical needs of the individuals, it was decided to train the following behaviours:

- Touch: a scraper was used to desensitize the animals so that any body part was reachable to allow local healings.
- Auscultation: to make monitoring the heart and respiratory rates easier.
- Magnotherapy: these therapies are used to alleviate the pain and have no side effects that is why we worked to desensitize and prolongate the stationary behavior during the therapy sessions.
- AB: behavior that enables us to observe and evaluate the motricity of the animals when they

go from point A to point B.

- Oral administration: the best way found to administer medications.
- Entry and exit under SD: behavior that facilitated the entry and exit to the designated areas when needed.
- Side lay: base behavior to make future sonographies easier or to offer a better view or access to the body sides.
- Puncture: Trained with an animal who had two skin bumps until we could extract a liquid, which allowed us to reach a diagnosis avoiding sedation. The behavior was trained later with the rest of the animals as a preventive measure.

Thanks to the incorporation of these detailed behaviours and the environmental modifications we created a proactive program that helped us take care of our old animals, improving their welfare and better both their physical and mental health.

Aeres MBO Barneveld

Jan Harteman

Aeres MBO Barneveld is a unique secondary vocation college in the Netherlands.

Our courses include animal husbandry and management, veterinary nursing, equine studies and agricultural studies among others.

We teach almost 2000 students at a campus and zoo, home to over 2500 animals, from regular pets to exotic mammals, birds, reptiles, amphibians and invertebrates.

Our college is unique in the Netherlands, being the only educational institution accredited as a zoo, following the Dutch and European Zoo Directive.

Students take care for the animals 365 days a year; first year students take care for feeding and husbandry, while senior students manage their own department and coach the first graders.

We participate in the European Professional Zookeeper Qualification Framework (EPZQF), an initiative by the European Association of Zoos and Aquariums (EAZA), in 2018 our first students will be certified as a zookeeper following the EPZQF guidance.

We would like to tell you more about our unique position and we would like to introduce our plans to officially open as a public zoo in the next few years, fully operated by students.

The Illustrated Handbook of Zoo keeping – an ICZ / WAZA project

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VICE PRESIDENT AND CHAIR OF OUTREACH ICZ

This presentation explains an exciting project being undertaken by the ICZ and WAZA. This project began as a result of a presentation at the ICZ in 2012 which identified a lack of training material in India for zookeepers due to the variety of literacy rates and the variety of languages spoken.

The ICZ is seeking photos to help create icons that can be used to show keepers, without the

need to be able to read, how to do daily duties.

Universal icons are being used so that it crosses all cultural barriers.

The work is being carried out by students of the Academy of Visual Arts, Frankfurt, Germany. This presentation will show some of the icons already developed and discuss the various chapters proposed. These include feeding, cleaning and safety in the first instance. It will explain how the icons are intended to be used.

Finally, we need more help in obtaining pictures and we are calling on all keepers to assist worldwide.

Northern fur seals in Moscow ZOO: keeping, training and breeding

Sochina Vera

This article describes the experience of keeping a group of Northern fur seals (*Callorhinus ursinus*) in Moscow Zoo from 1995 till current moment. In our zoo lives a harem group of fur seals which consists of a mature male and four females of different age. All around the year the animals are kept in a complex which consists of an open aviary and internal premises connected to it. The fur seals may always choose where to be – on open air or in internal premises. The water in all the pools is fresh, in constant circulation, the temperature varies from 8° (in winter period) to 20° Celsius. Even in coolest weather the fur seals prefer to spend time in the open pool for the most of the day, but for the night they usually move to internal premises.

The fur seals ration in Moscow Zoo includes 11 types of fish and squid. The animal appetite differs from 2,5 to 15 kg a day, depending of sex, age and animal condition. We work in direct contact with animals, all the fish animal gets only from the keeper in everyday training process. The amount of fish consumed by each animal is thoroughly documented which helps to evaluate the year dynamic of feeding for each animal and correct the ration if needed. Training is also focused both on increasing the movement activity and adoption for cooperation during veterinary and other zoo activities. During rookery period we continue to train all the animals in harem group but exercise additional caution and politeness towards the mature male allowing him to control situation and females.

Starting from 2014 our fur seals group began to exercise sexual behavior in period from May to September. In 2015 a cub named “Flint” was born. His mother “Yushka” took perfect care of the young keeping tight contact with the keepers. Around 5-month old “Flint” switched to independent fish feeding.

Starting from 2014 we observe the abrupt seasonal changes in fur seals behavior and feeding. From May to September the heat period takes place. The male practically doesn't feed during this period and loses approximately 1/3 of his weight which corresponds the natural situation. The females show the appetite increase during summer (which is natural during lactation). It is interesting to point that the male's most expressed feeding decline takes place after the end of the intense period of rutting and corresponds to the period of female's maximum appetite. Such information is nearly impossible to gather during observation of fur seals in natural conditions. Only Zoo studies together with the daily fixation of feed amount allow us to find these interesting patterns.

Introduction of an imprinted *Puma concolor* to a pre-established social group.

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Section:

Animal Welfare

Abstract:

Introduction:

With its mission to protect nature, Fundación TEMAIK Ñ collaborates with Argentinean wildlife authorities as needed regarding confiscations, seizures y cases dealing with wildlife mascots. This is how, the history of “Mau” began in September of 2016. An 8-month-old female *Puma concolor* was found outside of the city of Buenos Aires wearing a collar, which obviously reflected its situation as a mascot.

At TEMAIK Ñ, we have an established group of four pumas (“Yaco”, a vasectomized male; “Maggie”, a dominant, adult female; “Lisa”, an adult female; “Chumba”, a geriatric female). The challenge was to socialize these five animals, therefore offering a better quality of life to “Mau”.

Materials and methods:

On September 11th of 2016, an 8-month-old female *Puma concolor* with a high imprinted behavior due to her time as a pet, was admitted to the institution’s veterinary hospital. At check in, our veterinarians realized that the animal lacked claws on her front paws and, due to malnutrition, showed signs of osteoarthritis in one of her limbs. Due to these three reasons, it was decided that the animal could not be returned to the wild, but instead, it was decided that introducing her to an established group of pumas would be the best option to fulfill her behavioral and social needs.

After going through quarantine at the veterinarian hospital, the animal was sent to the puma enclosure’s holding area. The area has five rooms connected by doors, two on each side (A and B; C and D) and a middle door that is connected to the exhibit (the cave). The first step in introducing her was to keep her in the holding area for a week, with doors open, while the rest of the group was help on exhibit. This way she was able to recognize the other animal’s smells while watching them through the cave door. Here we noticed a very high tendency to want to interact with the keepers that were observing her. The next step was to give the animal access to the exhibit for a week in 3-hour daily sessions before releasing the group. Then the process continued by placing her with each of the group members, one at a time, for a week at a time (for three hours every day).

Results:

Her imprint behavior decreased significantly. Her seeking of human contact decreased not only on exhibit but in holding and were replaced with typical species-specific behaviors, such as climbing, stalking y running. “Mau” has now incorporated herself into the puma’s social group, made up of the four females at the institution.

Conclusions:

This process helps the keepers increase their observational skills. Knowledge of the species’ natural history helped detect an early estrus cycle and delay the introduction, before there was a chance for aggression among the animals.

Our jobs are reflected in the improvement of their well-being and being able to tell their story helps protect nature.

Habituating a *Pudu puda* to a new environment

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Section:

Animal Welfare

Abstract:

Introduction: The Bioparque Temaikèn has an exhibit with pudus, a Patagonian deer that is considered to be the smallest in the world. There have been 2 females who have lived in this exhibit for a long time (“Renata” a geriatric, castrated female; and “Quimei”, a reproductive, adult female). The area is extensive and covered in medium high vegetation, which serves as hiding places for the animals. There is also a lake on one end, where two black-necked swans have a nesting area that the pudus cannot reach. We recently received a male, “Lihuel”, from Temaikèn’s Rehabilitation Center (CRET) in hopes of breeding the animals. Unfortunately, since Lihuel’s arrival, he has kept to the swan’s nesting area, even swimming to get to it. This has become a big challenge for his keepers, since they are unable to control his environment and he hasn’t interacted with his conspecifics, his well-being has been negatively affected.

Material and Methods:

After observations and tests, we noticed that “Lihuel” had a preference for certain items in his diet (apples and carrots). Based on this, we began establishing a bond with him. Gradually we approached the edge of the lake, offering him these food items. We noticed that his predisposition to eat was stronger than his need to avoid us, so this allowed us to get closer and closer to him. The next step was to use the same RECALL we were using on the females for him (after ringing a bell, they are given apples and carrots). After several sessions, we would move away from him, then ring the bell so that he would approach us and receive the reinforcement. Seeing his response to the recall and his trust towards us, we decided to place a platform at the edge of the lake so that he could cross the lake without having to go in it.

Results:

As time went by, his time with the other animals and his exploration of the exhibit increased until gradually he spent more time in the larger part of the exhibit.

Nowadays, “Lihuel” has more control over his environment (with the ability to choose going to the larger or out of reach area), interacting with the females, and responding to the recall without mattering where he is in the exhibit or holding area.

Conclusion:

Knowledge of the species helped us recognize behaviors that we would need to work on with “Lihuel”. When dealing with skittish animals that are easily startled, it is important that the keepers establish a HAR (Human- Animal Relationship) that ensures trust needed to be able to make daily observations. Using this trusting relationship along with husbandry has helped “Lihuel” understand and be able to adapt to his environment, giving him more control over it. It also helped him connect with the social group. This way, we were able to see higher welfare indicators without affecting him negatively during the process.

Improvements in feeding protocols for bird enclosures

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Section:

Animal Welfare

Abstract:

Introduction:

At Temaikèn foundation, we have an enclosure where we keep forty palmiped birds, two seagulls and four Black-faced Ibis. All are indigenous birds from the Patagonia region of our country. This enclosure has a lake, a part of stone simulating a south Argentinian beach and a grass area. This enclosure and the way the diet was presented to the animals, not only attracted loads of outsiders like pigeons, rodents and guira cucko. We also noticed that our birds didn't consume all the food according to their diet, and that represented a loss in our animals welfare.

Methods and material:

We noticed that pigeons and rodents were eating from our palmipeds food (a mix of pellets and corn) when their diet was placed in metal feeding bowls on the ground. We also observed that our animals didn't approach the feeding bowls.

Studying the natural history of these birds feeding and foraging behaviours, we decided to change the focus. As these birds feed naturally in water, we decided to change the classic metal feeding bowl in the ground for floating feeders.

These new feeders have a weight to stop them from moving too much, like an anchor, and also a float to ensure they don't sink. It is important to note that these feeders don't have and are not attached to any solid rigid structure, as this could be used by pigeons to stand and steal the food. The change in the location of the green leaves in their diet also incremented the repertoire of natural behaviours such as diving and spooning.

In the grass area of the enclosure we had to modify the ibis feeder that contained small bits of meat and chicken and use to attract small birds of prey. We did this by digging a hole in the ground to place the feeder and covering it at ground level with a net with holes big enough for the beaks of our birds.

Results:

We observed significant improvements in the consumption of the diets and a decrease in invasive vectors in the area. At this time, a design has been implemented made from the various prototypes and layouts that were designed to prioritize food consumption of the birds. This reflects directly on the welfare of our individuals.

The observations that were carried out to assess the new feeding routine, made us notice the birds preference for leafy greens. These observations were also very useful for us, as they allowed us to do daily counts and checkups in this interspecies enclosure.

Conclusion:

Throughout this year we achieved a big improvement in the way we feed our birds. We noticed that by knowing your animals, their behaviour and their surroundings, we can offer them big improvements without having to spend too much money or having to invest too much time, and these changes can be key for animal welfare.

Changes in the handling of the American black vulture (*Coragyps atratus*)

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Format:

Oral presentation

Section:

Oral presentation

Abstract:

Introduction:

The Animal Ambassador program was created to tell stories about problems some of the wild animals that have come to the Temaiken Foundation have had (all human related), thus sharing our knowledge and fulfilling our mission to protect nature. Currently, this program consists mostly of raptors which are not on display. Among our ambassadors are two American black vultures, part of an earlier program at our foundation, who had a training schedule which could use improvement and whose handling proved to cause them anxiety. The challenge of changing their management to something more in line with their natural behaviour and establishing bonds of trust with the animals would ensure increasing their welfare substantially.

Materials and methods:

The management of most New World raptors and vultures includes using tools and techniques from falconry and combining them with animal training. In the case of the American black vultures, they responded to a call with a whistle to land on a glove. They were transferred to an amphitheatre for their activity while on the glove (only one bird per talk). Food was given with the right hand in a fist closed, providing control of the animal when they were going out to open areas, thus avoiding sudden flights.

When we moved the animals to the new enclosure, it was suggested that their handling needed to change and a new free flight activity in the park was developed. The first thing that was changed was to turn the recall whistle into a bridge. Then we strengthened the bond of trust with the animals by holding training sessions with both animals at the same time in an enclosed area. They were also fed in the glove, gradually rewarding longer periods of station. We were looking for ways to decrease anxiety levels.

Results:

We obtained satisfactory results. Now, the number of flights at every day training schedules has increased, the animal's station on the glove without having to be fed from a closed fist, they also

fly freely throughout the park, enabling us to offer public programs with both birds while telling their stories.

Conclusions:

When we started to work closer with the animals, we realized that they had a high cognitive capacity, which allowed us to ask for behaviours that were unthinkable in the past. We realized that by understanding the animal's motivations and behaviours, giving them control of the environment, we strengthened their bonds with their trainers. In this way, by letting them freely express their natural behaviour, we achieved a significant improvement in their quality of life. By understanding that animal welfare is not a fixed point, but has variable margin, we began to work as keepers in becoming more and more committed to animal care techniques that show significant improvements in our animals.

Planning the Daily Care of Mammals during the Restructuring of the Ex-Buenos Aires Zoo

Jonatan Chaves, Marcos Flores, M. Florencia Gomez, Paula Lemos, Mariano Narvez, Omar Recalde.

Keepers, Ecoparque Interactivo de la Ciudad de Buenos Aires

Since the Buenos Aires Zoo began its conversion from Zoo to Ecoparque, keepers have developed strategies to achieve the various objectives that were included in the restructuring project. One of the main purposes of the keepers, who were organized by sections depending on the species, was to plan and differentiate the training program goals for the animals that were going to be moved to other institutions (in Argentina or other countries) and for those that would stay at the Ecoparque. To be able to do that, it was essential to create a schedule that included the days, timetables and keepers in charge of training, as well as the dates that the animals would leave the zoo, and to successfully coordinate these and the rest of the animals in the Ecoparque's schedule with the behavioral, veterinarian and nutritional areas. Each sectional keeper was meticulous in their planning and development of needed objectives to effectively accomplish the established goals.

This section consisted of 6 keepers and 16 animals including felines, elephants and bears. Fourteen of these animals would be moved to other institutions and therefore all needed to be trained to voluntarily cooperate in veterinary procedures (tuberculosis test, blood samples, weights, vaccinations, chip placement, etc.) and to enter their transport boxes.

Furthermore, the section has two geriatric individuals: an ocelot (*Leopardus pardalis*) that is 13 years old and a snow leopard (*Panthera uncia*) that is 14 years old. Both require special veterinary care due to issues associated with their age.

In order to develop and maintain successful training and environmental enrichment programs, we used the S.P.I.D.E.R method as a tool to establish goals and maintain consistent progress. This method is used by many institutions all over the world since it allows us to check, polish, and modify the set objectives and adapt as needed for each individual.

The keeper's responsibility and role is to achieve the highest standard of animal welfare, which is why it is important to have a team of individuals whose experiences complement each other and work towards improving the process. For that to happen, welfare techniques based on zoo animal's needs were developed for the time they are at the Ecoparque and while they are under our care during the restructuring of the institution.

Increasing the quality of life for four *Leopardus geoffroyi* at the Ecoparque Interactivo (Interactive Ecopark) in Buenos Aires

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Four *Leopardus geoffroyi* wild cats named "Panthro", "Filomena", "Loca" and "Gastón" inhabit a circular structure that is linked together and individually separated by a fence. The area for each animal is less than 3 square meters and 2.30 meters tall. Their situation is complicated in that their enclosure is considered a historic patrimony and therefore cannot be changed as needed for the species. Historically these specimens were cared for without providing the proper training techniques or environmental enrichment (cognitive stimulation, physical or emotional) to be able to face and deal with such a limited space.

Once the Buenos Aires Zoo began transforming into the new Eco Park project, it was decided to start proactive training and enrichment programs to increase the animal's quality of life. The first behavior they decided to work on was transferring the specimens from their holding area to the exhibit area. Of the four individuals, "Filomena" spent more than 70% of the day in a small cave inside the corridor. She was only seen outside on a few occasions and when she saw someone, she would quickly hide again. "Panthro" enjoyed both spaces, but he would not go in or out when requested and was anxious during the process. "Gastón" would become very nervous whether going in or out and did not respond properly when requested, and "Loca" would desperately run out of the holding area. The Premack principle was used progressively for the four individuals. The first goal was to desensitize the animals to their keepers, incorporating the clicker and a target. After the sixth week, notable changes could be seen. Sessions had various reinforcers.

Social reinforcer: by the third month, the following signs were spotted: affection such as purring, rubbing side to side before and after each session, and a relaxed and expectant expression in front of their keepers.

Auto re-enforcer: each session presented cognitive challenges where they had to resolve different difficult situations in the limited space.

Hunting re-enforcer: a strategy where the reinforcement of small pieces of meat were tossed in the air so that they could catch them.

Daily physical, mental and social stimulation resulted in three of the four wild cats increasing their delay reaction to the in and out commands. They developed behaviors such as entering a

box, staying inside of it with the door closed, and sitting on a scale with just a verbal command. Close observation and target positioning allowed for body inspections and measurements. A much better bond with the keepers was seen, along with emotional stability that resulted in the chance to see the individuals resting in elevated areas in the sun, with their bodies completely relaxed and actually utilizing spaces of their enclosure and inside holding area in a normal way. The most remarkable improvement could be seen in “Filomena” who with training, enrichment, consistency and changing strategies, after four months, overcame her apathy and today is the first individual to achieve any new behavior given to her.

The Restructuring of the Institution Involved in the Daily Care of a *Leopardus pardalis* Specimen

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ZOOKEEPERS, INTERACTIVE ECOPARK OF THE CITY OF BUENOS AIRES .

Within the former Zoo of the City of Buenos Aires lives an Ocelot (*Leopardus pardalis*) named “Chipy”, who came from a private owner who had him as a pet. He is a geriatric animal that has lived in two different places within the zoo, in which he has not been able to develop a broad behavioral repertoire specific to his species due to the precarious characteristics of the environment. Both areas were small historical monuments, originally built for birds, which did not meet the animal welfare needs required for this species. With the cooperation of different areas in the zoo, we began to plan a change of environment to improve the well-being of the animal. The first stage was to prepare and create an available space with greater comfort while thinking about the basic needs of the species. At the same time, the caregivers who at that moment worked with this animal began to train him to enter the transport box so that when the moment came to transfer the animal, it could be done through trained behaviors. A new exhibit was set up, with an inside area 200% larger in size than the previous one, with tall structures, shelters, and scratching posts. The outdoor area is 500% larger and has a body of water, vegetation, aromatic plants, platforms, walkways with tall scratching posts, and different types of substrate. After the transfer, the animal remained in the indoor area for a day to be able to get used to the new space before gaining access to the outdoor area, as well as to begin bonding with his new caregivers. On the second day, he was given access to the outdoor area to explore the new environment. A new training program started using operant conditioning techniques with positive reinforcement to achieve different behaviors that would increase the quality of life of the animal. So far, we have been able to medicate the animal daily, weigh the animal, inspect his paws and claws, and get him in different positions that will later become more complex to achieve veterinary medical behaviors, such as blood draws and vaccination, among others. At the same time, an environmental enrichment plan is being developed aimed at expanding his behavioral repertoire. The importance of the transformation of the institution and new techniques in daily care allows caregivers to generate a positive animal/human bond, and for the animals to have greater control over their environment to reach the high standards of animal welfare that these institutions must provide.

Training program in *Elephas maximus* and *Loxodonta africana* for health requirements and daily care

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INTERACTIVE ECOPARK OF THE CITY OF BUENOS AIRES

Abstract

As part of the transformation that the Interactive Ecopark of the City of Buenos Aires is going through today, the areas of Animal Behavior and Animal Care have planned new objectives and changes in its development based on the health needs of the animals affected. Likewise, this process must respond to the different needs presented by each species or individual in daily management and general care.

Three female elephant individuals live in the park: two African elephants *Loxodonta africana*, named “Kuky” and “Pupy”, and an Asian elephant *Elephas maximus* named “Mara”. One of the most important parts of the project is the transfer of the Asian elephant to a sanctuary in Brazil. The primary objective of the animal training program for elephants is to fulfill the health requirements required by the transfer, such as tubal swabbing for tuberculosis samples, blood extraction, body measurements, and chip placement for identification. As secondary objectives, the program will continue with podiatry training, environmental enrichment for cognitive stimulation, and vegetation foraging. Because all three individuals share the same exhibit, all three must be included in quarantine. Although “Mara” is an animal that has been trained for many years under the care of different keepers to perform the foot treatment, new care strategies mean a new cognitive challenge. By increasing the daily training sessions, the animal has more opportunities to work on different challenges based on the planned objectives. One of the most difficult behaviors was the training of tubal swabbing with the African elephants, since they were averse to their trunks being touched and physical contact with their caregivers. The formal plan of training with objectives, planning, development, and readjustment has allowed us to carry out adequate daily care. We have been able to better observe more of the behaviors that each one of the elephants has obtained, and consequently a greater knowledge of the specific behaviors of each elephant was gained. This allowed us to learn their secondary reinforcers, which were extremely useful in their daily training. Today, the problem of physical contact, which both African elephants had, is no longer a problem through systematic desensitization. What used to be aversive has reversed to such a point that both elephants now approach their caretakers on their own accord every day to be touched.

Evaluation of stress related lactate and blood glucose levels due to capture in Broadnose Sevengill Shark *Notorynchus cepedianus*

Julieta Janez

The effects produced by capture, handling and release in chondrichthyes are evaluated predominantly by measuring immediate, short duration physiological responses. The capture and subsequent release induce various degrees of physical trauma and physiological stress, whose magnitude depends on the method and duration of the capture and the metabolic capacity of the species, which may result in immediate or delayed mortality of the organisms. Changes in blood chemistry relating to capture provide information regarding the degree of stress in elasmobranchs, with strong evidence that the level of physiological disturbance manifested in the shark blood correlates with a wide range of stressful factors.

Glucose, lactate and pH are the most commonly used indicators to measure physiological stress in response to an exhaustive exercise in many elasmobranch species. In recent years, the measure of lactate concentrations in blood and plasma in sharks has become a common procedure in studies that investigating metabolic response to stress factors. Within the secondary stress response, three prominent metabolic alterations occur: impact to the levels of blood glucose, hematocrit and lactate. These three metabolites have been widely used as a measure of the secondary stress response in sharks in general.

The lactate and glucose levels of the Broadnose Sevengill Shark *Notorynchus cepedianus* were compared from blood samples taken from wild (captured and released) and from captive specimens. In the wild, two capture methods were used: rod and spinel, which implied different specimen struggle times. In the Aquarium, the method of capture and tonic immobility was applied to take samples.

From the results it was observed that the lactate levels in the blood of the specimens captured with spinel was significantly higher than those caught with a rod and those handled in the aquarium. The values of lactate in the captive and captured species with a rod in the wild were very similar. This suggests that the best method of capturing the shark in the wild for later release is with a rod since it minimizes the time of struggle and handling of the specimens, therefore stress caused by capture, in terms of blood lactate, is minimal.

Regarding glucose, the blood values of the free-living specimens did not show significant differences between the two types of capture, nor with respect to the glucose measured in the captive-kept sharks.

The differences in the stress responses of the sharks are consistent with the differences in the fighting behavior and the fighting time exhibited for the specimens on a fishing line, in a spinel or at the aquarium-controlled catch.

Glucose and lactate can be used as indicators of the secondary stress response in the Broadnose Sevengill Shark (*N. cepedianus*), however, more work is needed to understand the extent to which glucose increases in response to the stress caused by capture.

**All on the same tree.
Integration of two groups of *Alouatta caraya*.**

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BIOPARQUE LA PLATA

Introduction:

Many of the wild animals that spend their lives under human care in institutions, inherently have the need to form social groups to demonstrate some of their species-specific behaviors. The keeper in charge of gregarious animals must attend to behavioral and environmental issues from, at least, two dimensions. One is defined by the social logic that governs the groups and the spatial needs that arise from it, including the roles and functions that allow individuals to be identified in their social function. The other defined by the history of each individual, a deciding factor in the development of social behavior. The mix between these dimensions guide the development of strategies pointing to the well-being of animals in general, in particular gregarious species, whether they are already formed groups or forming a new one.

Objectives:

In this presentation, we will try to demonstrate the integration between two groups of black howler monkeys (*Alouatta caraya*), both inhabitants of the current La Plata Bioparque, which were moved to a common enclosure. Group I is composed of two young female adults (“Juana” and “Rita”) and a young adult male (“Yayo”); Group II consists of two males, an older one (“Papa”), father of the other young adult individual (“Africano”). The enclosures of each group were similar; located at each end of the park, both were small, low spaces, made of cement, without vegetation or species-specific needs. The new enclosure offers a large external solarium, with grass and low vegetation and a large tree with poles and some trunks, and two large internal spaces with concrete platforms at different heights. After the transfer, it was observed that “Yayo” dominated the external solarium and the only tree of the new enclosure, allowing “Juana” and “Rita” to enter the area and aggressively displacing “Papa” and “Africano”, who are confined to the inside of the enclosure. The original groups were still present, but were now disputing over the new space. Stress in the group became evident and the displaced animales had difficulty accessing the food; injuries also began to appear, some serious, a product of the aggression. Deteriorating well-being urged the need for new group strategies.

Materials and Methods:

As a first step, abundant branches with foliage were incorporated into the solarium and holdings and as a complement to the diet, along with feeders for greater food distribution, eliminating the dispute over resources. Simultaneously, interactions between the individuals begin to take place, mediated by the keepers, using “Rita” as a link between the displaced and the rest of the group. At a later stage, “Papa” and “Africano” are offered the possibility of joining the group when they wished, always providing an escape and refuge for their safety. Firefighter hoses were also attached to different external structures, to provide greater elevated movement. The holding area was also decorated with elevated hose beds accompanied by structures such as trunks and stairs.

Results and Conclusions:

Through planning strategies based on specific needs of the species and individuals, “Africano” joined the group without problems, forming a group of 4: two females and two males. The work with “Papa” is still ongoing. Actions designed for well-being only fulfill their purpose if they are previously analyzed, applied with planning, observation and monitoring through the interdisciplinary work of professionals in animal behavior, care and management.

Rimbula*Herma Kamphorst*

Wildlands Adventure Zoo Emmen in the Netherlands opened her doors 18 March 2016. One of the three walking routes has a big indoor jungle called Rimbula. This 23 metres high greenhouse is 3 football fields and has a jungle theatre with a family show, a boat ride, Lori feed and a children’s jungle trail. In addition there are living 22 bird species, Lar gibbons, spider monkeys, ring-tailed lemurs, geckos, Rodriguez flying foxes, several fish species, insects, frogs and Asian elephants. To set up this new concept with storyline within a short period of time was challenging.

This poster contains the intention, course, setbacks and successes so far. Technical problems with air grills and water temperature, mixed exhibit experiences, the hazard of fast growing plants, use of tree chip, births and losses, male group try out of Turaco, bird shelter for bird influenza period, pestcontrol, pinched bird toes, policy on identifying rings and chips, birds and flying foxes who came into the water, ants and lemurs walking everywhere which is not the intention! Yes, they’re clever! But there is lots of space, it’s always good weather, lots of births and fun to work! So... Rimbula offers a lot but also a lot to think about and problems to solve.

Animals training at the Endangered Primate Rescue Centre in Vietnam*Louisa Bartlett*

The endangered primate rescue centre was set up in 1993 and was the first animal rescue centre of its kind in South East Asia. They now have over 150 rescued primates from 15 species, many of which are critically endangered. I spent five weeks volunteering at the centre working closely with the 27 local animal keepers. I helped out with all Keeping duties and also helped to teach the staff about new enrichment ideas. The keepers were great and very friendly although most keepers didn’t speak a word of English and I don’t speak any Vietnamese, so communication was mainly done through body language. While I was working there Manu Habe an animal trainer from Austria came to volunteer for three days. I hadn’t realised they were interested in animal training but Elke the foreign head keeper asked her to set up some training programs and I assisted.

“Freida” a young female Red Shanked Douc Langur (*Pygathrix nemaeus*) was chosen first to start training with. The aim was to get her to present her chest and get used to us touching that area, so in the future she can be checked for substantial milk flow. We started off with a knotted rope and got her to hold it with her left hand. Instead of using a clicker/whistle the word good was used as the bridge and small chunks of sweet potato were used as the reinforcer. We moved onto bring her chest forward by placing food near her mouth and as she moved forward we touched her chest used the bridge and then rewarded. She picked it all up very quickly and hue, a local keeper took over to learn how to carry out the training. A second knot was added for her right hand to stop her from reaching through to take the reward. The same training technique was used on “CP” a female Delacour’s Langur (*Trachypithecus delacouri*) but unfortunately Hue couldn’t do the training with CP as she would attack female Vietnamese keepers. I took over training for the next 4 weeks and passed it on to Elke as none of the male keepers were very keen. “CP” picked up training well but after a week she started putting her feet up to the knots instead of her hands. So, I solved this problem by adding in another two knots for her feet and she soon learnt where to keep them.

Lastly, we started training two male Northern White Cheeked Gibbons (*Nomascus leucogenys*). The aim was to try and get them to stop grabbing at keepers, which to me seemed like a big task. We started by just getting them to come down and sit on a spot, using a clicker as the bridge and then reinforced with grapes. If they were aggressive we waited and then started again. They both took to it really well and by the 4th session they were more relaxed and I was able to get close to the mesh and stand there with no attempt to grab. I then introduced my left hand pointing towards their thigh (for injection training) and slowly but surely by the 6th session I was able to get to the mesh and actually start touching their right thigh. Unfortunately, other than the training done on “Freida” and “CP”, the rest hasn’t been kept up but the centre is always looking for volunteers to come and give a hand and teach new skills to the keeper. Plus, the training can always be re started, as it was only done in 5 minute sessions, every few days, after the initial first 3 days.

The influence of enrichment, noise and visitors on the behaviour of the aye-eyes at Frankfurt Zoo

Bachelor Project of Miriam Gabriel, supervised by Prof. Dr. Susanne Foitzik (UNIVERSITY OF MAINZ, INSTITUTE OF ZOOLOGY, DEPARTMENT OF EVOLUTIONARY BIOLOGY) and Prof. Dr. Manfred Niekisch (ZOO FRANKFURT; UNIVERSITY OF FRANKFURT AM MAIN, INSTITUTE OF ECOLOGY, EVOLUTION AND DIVERSITY).

Stereotypies are defined as invariant, repetitive behaviour patterns without obvious goal or function [1]. Animals in captivity may develop stereotypic behaviour due to a stressful or aversive environment, low stimulus input or other reasons [2]. Therefore, stereotypies can be, but are not necessarily, a sign of poor welfare [3]. To enrich the environment of an animal by adding stimuli that help to fulfil the animal’s needs is one possibility to tackle stereotypies [4]. To find out whether the stereotypies in aye-eyes at Frankfurt Zoo can be reduced by short-term feeding-enrichment, we analysed their behaviour under different enrichment conditions.

Bird keeper involvement in in-situ conservation at TEMAIKÈN Foundation's Osununú Natural Reserve (Provincia de Misiones, Argentina)

Pablo M. Dovico

Ma. Alicia de la Colina

Working for conservation is a fundamental task in modern zoological institutions. WAZA (2015) defines conservation as "perpetuating long term populations of species in natural habitats" and TEMAIKÈN Foundation's keeper area also contributes to this concept. It is important that this work team understand how conservation is related to their daily work and thus be able to explain key concepts about biodiversity and strategies used by zoological institutions to mitigate effects of the its continuous loss.

At the beginning of 2017, TEMAIKÈN Foundation's Conservation Department asked the specialized keepers of El Lugar de las Aves to characterize the birds found in the Osununú Nature Reserve. The objectives of the proposed work were the following:

- Update and generate more information about the birds that live in that area.
- Analyze and identify which species could use IBAS criteria (Important biodiversity and birds areas) to fulfill one of the program categories. This way, it would be possible to increase the degree of conservation importance at an international level.
- Provide interpretive educational presentations to reserve residents and park rangers so that they can learn and recognize the value of the bird life present in the reserve.
- Communicate TEMAIKÈN's conservation efforts to visitors through keeper's talks at the immersion aviaries in El Lugar de las Aves (The Bird Place).

Four bird surveys were carried out, one for each season of the year, in order to register the species present in the reserve. The surveys were completed by the bird keepers and park rangers from the TEMAIKÈN Foundation. Through daily counts and bird observations in the immersion environments, the keepers managed to use similar techniques used in field samplings. Species present during each season were recorded. The results were: an increase in knowledge about the reserve's bird life and the addition of 40 species that had not been previously sighted. Fulfillment of the IBAS criteria category for 31 species present. This information will allow the TEMAIKÈN Foundation to ask the Bird Life International Institution to grant the Osununú Natural Reserve an IBAS category.

Two training workshops were also held. One of them in a school near the reserve, where different interpretative activities were carried out about the birds that inhabit that region, and the other workshop was held in the reserve for the residents and agricultural producers from Osununú. The topics of biology, identification and conservation of birds that inhabit the area were addressed. Educational keeper talks about the work happening at The Bird Place of TEMAIKÈN Biopark where experiences and results obtained in this survey were shared with visitors.

This is an example of how zookeepers can collaborate directly with in-situ conservation projects. Acting as a link between conservation projects and zoo visitors who interact with them daily. Thus demonstrating the role of modern zoological institutions and their importance in providing knowledge of, in this case, conservation of a protected natural area.

**Itaipu Binational - Smithsonian
Pilot project
Environmental Enrichment Program**

RESEARCHER: *María Luisa Ortiz* (CIASI-IB)

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Summary

For the implementation of the Environmental Enrichment Program (PEA) at the Wild Animal Research Center (CIASI), a Pilot Project will be developed with 4 specimens of jaguar (first stage) due to the ease of implementation of a variety of enrichments with this species and the imperious need that these individuals have, since they live in solitary and sometimes not suitable areas. The Pilot Project will be socialized with the technical and operational team of the area, and other volunteer keepers will be trained in the observation and recording of animal behavior. The study of the behavior and offer of enrichments will have two phases: the test phase and the baseline. In the test phase, it will be elaborated and worked based on an initial ethogram. In this stage the volunteer keepers will have the opportunity to know and use this ethogram to be trained in the taking of records. In the baseline, the observations that will be part of the study will be made, which covers the BEFORE and DURING the offer and interaction with the enrichment items and how this influences the behavior of the animals studied. Behavioral observations, both in the test phase and in the baseline, will be carried out from Monday to Friday, twice a day, in the morning turn at 10:30 am and in the afternoon turn at 4:00 pm. The observation time interval is 10 minutes for each individual. The result and success of the Pilot Project will be relevant to demonstrate the importance of the PEA in the CIASI. For this reason, it focuses on the need to have the participation and commitment of the entire technical and operational team, so that the implementation of the PEA can be done gradually starting with felines and extending it to other taxa gradually.

The naked mole rat

Renee Higler

The naked mole rat is a rodent living in a dry and hot parts off the east Africa. They live under the ground in self dug tunnels and caves, which they create with their continuously growing front teeth.

They live in a colony, a society with different generations specialized in reproductive and non-reproductive individuals and with cooperative breeding care. There is one queen and a few breeding males, they are the largest animals in the colony.

The mole rat is a mammal but is unable to control their body temperature (ectothermic) To reach the right body temperature the animals stay close together in a hole just under the surface and

warm up with help from the sun. In the zoo we provide special heated tanks where they stay together. They don't have body hair and are practically blind. To compensate this blindness they have excellent hearing and smell.

The naked mole rats are the longest living rodents. In captivity they sometimes live up to 30 years, this is 9 times longer than a mouse of the same size. They do not age and have no tumours or cancer. Furthermore, they can go 15 minutes without oxygen.

In Wildlands Adventure Zoo Emmen the habitat has been recreated for the naked mole rats with glass tubes and pots. This way the public can see these amazing animals well. The tunnel system is designed in such a way that the animals can walk forwards, backwards and up and down. To show their natural behaviour they get wood chips to dig in and to drag. Everything must be cleaned as sterile as possible. The zookeepers always wear latex gloves and overshoes. The enclosure must be sound-proof and the temperature should be at least 25 degrees Celsius with a humidity of 40 %. There are different "rooms" each with its own function. For example a toilet and a room where they store the food. The food consists mainly of tubers and roots. The food is rinsed well to prevent contamination from outside.

The colony in Emmen is old (20 years) and last year we started a new colony: one female and three males from Berlin. This year the queen has successfully received her third litter.

Advice from a naked mole rat:

- Constantly expose yourself to new things
- Always show everyone your good side
- Get out from your comfort zone. Be daring!
- Share yourself with the world – If you've got it, flaunt it!
- Take risks. Have some skin in the game.
- Moisturize, moisturize, moisturize.

**Building links from a change in paradigm.
Additions to the behavioral repertoire of the *Leopardus geoffroyi*.**

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BIOPARQUE LA PLATA

Objectives:

During the last several years in Latin-America, there has been a transformation in traditional zoological institutions towards a new paradigm that places animal welfare as the main focus. Within this framework, keeper training is a necessary tool so that institutions can transform. This presentation will explain the progressive process of animal welfare standards for two geriatric *Leopardus geoffroyi* females that currently reside at the Bioparque La Plata. During the initial observations we were able to assess that these individuals did not enter their holding area when humans were present, showed fleeing behaviors, and were hidden during most of the day.

These behaviors not only reflected a limited behavioral repertoire, but also made it difficult to work in the areas on a daily basis (for keepers, veterinarians, biologists, and maintenance).

Material and Methods:

Training techniques along with sensory enrichment and settings were used as a base for this project.

The main training techniques used were desensitizing the presence of keepers with negative reinforcement; later, we were able to use a bridge (clicker) and began targeting.

Additionally, the holding areas were set up according to the species, which included wooden platforms at different heights, a resting place with a hay bed, bundles of substrate and pipes to reduce their exposure when they entered. Enrichment such as scratchers, scents, food hidden in objects, balls and novel food items (egg, cornalitos (fish species), fish puree, Royal Canin canned cat food) were also placed in the holding area.

The exhibit was also redesigned incorporating different layered platforms with connecting bridges made out of logs and high hiding places, giving both animals the ability to travel throughout their exhibit and more surface area to roam.

Another action taken, which aligned with one of the main objectives, was to place a visual barrier by a fence and holding area that was exposed to the public.

Results and Conclusions:

During the process of implementing the training, exhibit and enrichment techniques, changes in behavior and space use was evident. Holding areas were no longer hostile places, but rather they became resting and refuge areas that made them feel secure. The mountain cats began entering and would stay in even in the keeper's presence, allowing them to be weighed, medicated and permitting staff to make observations based on their physique. There was also evidence of greater use of the exhibit's space.

We can conclude that thanks to training animal care personnel on topics regarding environmental enrichment and training, and applying their learned skills, we were able to provide cognitive and environmental challenges that enriched the behavioral repertoire of these animals, while considerably decreasing fleeing behaviors, giving the animals more control and less predictability in their exhibit.

Filing hippopotomous hooves (*Hippopotamus amphibius*): The importance of a proactive training program

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One of two *Hippopotamus amphibious*, “Bibi”, living at Fundación Teraikèn appeared with cracks in the walls of three toes on her front hoof. Two of the cracks were successfully treated topically, while the other required filing the wall of the hoof. The procedure required access to the basal border which required that “Bibi” remain with her foot upon a platform, and the injured toe towards the outer edge. Treatment was needed immediately due to the imminent possibility of the crack expanding and thus compromising the toe, which could become infected and require surgical intervention.

The animal had had previous desensitization training on her feet (tactile, brushed on treatments, sprayed liquid applications) although she had not been trained for abrasive objects, such as a hoof file: a cold object with an irregular surface, completely foreign to the animal. Also, she had not been trained to hold a foot at an elevated level, a specific position that was going to be needed to be able to treat the animal.

After finding an appropriate platform for the project, an intensive training plan was developed using a continuous reinforcement schedule that focused specifically on the following items:

- Desensitizing presence and physical contact with the platform.
- Positioning the foot onto the platform.
- Desensitizing contact with the hoof file.
- Tolerating the file moving across her hoof, gradually working towards the basal side.
- Performing more intense movements that allowed making the needed cuts, with the animal in a calm, stationed position.

In just the course of 14 days the procedure was performed, including the training and filing of the hoof, and surgery was avoided. Afterwards, the animal was on an extended treatment which included several days of daily care for approximately 5 months.

This novel practice was accomplished in such a short time because of the following factors:

- Continuous effort in generating and strengthening an excellent relationship between the animal and its keepers (HAR). This allowed us to perform an intensive procedure without affecting or upsetting the trust of the individual during the process, key for the topical treatments needed afterwards.
- Extensive knowledge of the natural and individual history of the animal.
- Extensive observation and deep knowledge of the animal’s behavior so as to avoid sessions that could become negative.
- A proper training program and correct application of the techniques used.
- Inclusion of medical treatment in the training schedule before it was needed. This part was essential since prior desensitizing of the area permitted easy access and was fundamental for later treatments.
- Continuous communication and team work between the keepers and vet staff.

Methodology and material can vary depending on the trainer’s preferences or the needs of the animal to be worked on, but we believe the above-mentioned points are very important and indispensable to achieve a new treatment in such a short time, and all this should be part of the daily care of an animal.

Independently of a specific situation, we consider these work habits to be part of good animal care practices.

A browse plan for the south american tapir (*Tapirus terrestris*)

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In its natural habitat, tapirs' forage predominantly on selective browse. This consists of grabbing the branches or leaves with its proboscis and pulling, assisting with its lower lip, until it has ripped or has cut the end of the vegetation with its strong teeth. On the other hand, it can opportunistically consume fallen fruits, but generally consumes green vegetation and grass (El Tapir, *Tapirus terrestris*, aspectos biológicos y ecológicos: manual y atlas. – 1ª ed. – Escobar: Fund. Temaiken, 2008).

Based on this fact, the feeding habits of the tapir (*Tapirus terrestris*) living at Fundación Temaiken was analyzed. It was observed that feeding without the use of the proboscis (mainly kibbles and prepared diets) occupied a large portion of the daily feeding, while foraging and therefore, manipulation behavior, such as selecting and pulling, was very reduced.

Providing browse to herbivorous species is very important for the well-being of animals that are under human care. Vegetation is not just a complement to an adequate nutritional diet, but rather it allows the animal the freedom to look for and select their diet. So that a browse plan can be successful, it is necessary to first analyze two variants: What am I giving and how to do it. Usually more attention is paid to what species of vegetation is being given to an animal, without previously studying the anatomy of the animal so as to understand their behaviors or the way they feed in the wild.

Based on the two points previously mentioned, it was decided to look for a way to increase forage time.

We worked for four months with an adult, male tapir, analyzing how 3 species of vegetation were consumed depending on where they were located and how they were presented. First observations were made studying how the animal ate different types of plants, in the various parts of his exhibit, and videos were taken to observe his intake. This data was used to develop a browse plan that represented variability in location and delivery of browse.

We observed that most consumption took place where browse was partially held, not consider-

ing palatability or taste, which clearly coincides with the animal's anatomy. Therefore, we were able to prove that the South American tapir needs browse that is firmly held, within their height, so that it can rip the leaves using its proboscis.

Therefore, it is clear that a fundamental part of a correct browse plan is the animal's anatomy and behavior, since this is directly evident in its preference when it is time to eat.

By being able to successfully consume plants, the animal was stimulated into increasing the use of its proboscis, balancing the amount of time it spent eating from the floor and not using it. Therefore, if we wish to increase an animal's well-being within a complete husbandry plan, we should analyze the specie's natural behaviors, the amount of time it spends performing these behaviors in the wild and looking for ways to stimulate them through modifications in food presentation, along with offering enrichment and training programs.

ICZ *International Congress of zookeepers* expresses its appreciation and gratitude to all those people and institutions for their collaboration to promote the professionalization and best practices in animal care around the world.

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