

Poster abstracts:

### **A Golden Opportunity**

*A. Dixon, Carnivore Keeper  
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Auckland Zoo houses five Asiatic Golden Cats (*Catopuma temminckii*) – a breeding pair housed off display to the public; two young adult male siblings on display and a juvenile male ('Saigon') that was hand reared by Auckland Zoo's carnivore team in 2005. In 2004 the breeding pair successfully raised a litter of two males and surprised staff by giving birth again nine months later to a single male kitten. After four weeks the female seemed unsettled and was seen to be carrying the kitten around by the neck excessively. She did not appear to be suckling the kitten consistently and it was frequently seen being left outside in the open and getting cold. A decision was made to check the kitten for a lick granuloma around the neck as had been seen previously in a serval kitten at Auckland Zoo. Upon inspection, the kitten was found to have severe wounds to both sides of the neck and on veterinary advice was removed for hand rearing. The neck wound required intensive medical management, which meant parent rearing was not going to be an option. Once the wound had healed, he was given visual access to the parents for brief periods and occasionally supervised full access. Both the dam and sire showed no interest. At five months of age Saigon was transferred to an enclosure adjoining his parents and a formal operant conditioning programme began when he was six months old. The programme is in its infancy but results so far have proved promising. This poster is an overview of the hand rearing of Saigon as well as the training programme.

### **A study into the effect of browse presentation on the incidence of stereotypies in captive giraffe (*Giraffe camelopardalis*) at Auckland Zoo.**

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This study investigated stereotypic behaviour in captive giraffe at Auckland Zoo. The study involved the presentation of the daily browse allocation in a feeding enrichment device. This consisted of a double layer latticed cage secured to the perimeter of the enclosure. Behavioural observations, including the incidence of stereotypic behaviour, were conducted before, during and after the introduction of the enrichment device within their daytime outdoor enclosure. Three giraffe out of a group of four at Auckland Zoo were used in this study. Results showed that stereotypic behaviours, particularly head-tossing, were observed in all three giraffe but the frequency varied greatly between animals (Mean range; 158 – 2.5 behaviours per observation period). Although not statistically significant, stereotypic behaviour was reduced in all three giraffe and ranged from a reduction of 46 - 58%. Little or no change was observed in other behaviours but an increase of 20 - 29% in feeding and ruminating behaviour was observed in all three giraffes. Overall, introduction of the

browse feeding device reduced stereotypic behaviour and increased feeding and ruminating behaviour in the three captive giraffe, showing that this device can be used as a useful tool for enriching and improving welfare of captive giraffe.

### **A study into the effect of the location of food presentation on the use of the enclosure by captive Siamang (*Hylobates syndactylus*) at Auckland Zoo**

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This study investigated the effect of food location on the spacial use of the enclosure by captive Siamang at Auckland Zoo. Four Siamang were used in this study. The siamang had previously been presented with food on a platform suspended from the roof of the cage in front of the observation window (Zone 2) at one end of the enclosure. The study involved the inclusion of three additional platforms, which were located across the enclosure in zones 1, 3 & 4 (creating 4 platforms within 4 horizontal zones). Behaviour and location of siamang in the enclosure were then observed for one hour from the initial presentation of the morning feed. The results showed that presentation of food on a range of platforms in the enclosure increased the use of the enclosure up to a maximum change of 15%. In addition, presenting feed on 4 platforms resulted in a 14% reduction in idle behaviours, a 20% increase in food and object manipulation behaviours and an 83% increase in locomotive behaviours. The observations showed that the siamang spent considerable time during feeding time (51-54%) in zone 1 closest to the night enclosure but only 30% of this time was on the feeding platform compared with 40 – 60% with the other 3 platforms. Overall, the study shows that the food presentation within an enclosure can influence the use of enclosures and the activity, particularly locomotive behaviours, of captive siamang. This demonstrates the simple tools that can be used to increase activity and welfare of animals such as siamang in captive environments.

### **'Amazonia' at Blackpool Zoo**

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*Blackpool Zoo, Lancashire, United Kingdom*

In 2003, Blackpool Zoo was privatised after being run by Blackpool Borough Council since opening in 1973. Since this takeover by Grant Leisure Ltd (a subsidiary of MICE Plc), major developments and restructuring has occurred and is planned. This includes the development of a new visitors' entrance, which has in it a conference and exhibition facility, gift shop and fair trade shop, coffee shop and children's soft play area. This then leads to a new giant tortoise exhibit which houses Aldabara tortoise (*Geochelane gigantean*) and Sulcatta tortoise (*Geochelane sulcata*), and into 'Dinosaur Safari', a journey back through time to the amazing lost world of the

dinosaurs. One of the major new animal developments at present is the construction of 'Amazonia'.

'Amazonia' will be a unique walk-through, close encounter animal experience. It aims to create a naturalistic environment for a number of South American species. The exhibit enables the public to get an extremely close view of the animals, one that is not always possible with normal zoo barriers, and the interpretation throughout the exhibit will teach and guide people around the South American zone and species.

The animals to be housed within this development include a range of primate, aves and mammal taxa. The key species will be the free ranging primates, which include Common Squirrel Monkeys (*Samiri sciureus*), White- Faced Saki (*Pithecia pithecia*), Red Titi Monkeys (*Callicebus cupreus*) and some Marmoset species. The bird species that will be housed in the exhibit are mainly South American waterfowl, such as Rosybill Pochards (*Netta peposaca*) and Fulvus Whistling Ducks (*Dendrocygna bicolor*) which will be free ranging in the extensive central water feature. Also housed in separate aviaries will be Toco Toucans (*Ramphastos Toco*) and Blue-Throated Conures (*Pyrrhura cruentata*). At present there is only one non- primate mammalian species planned for the exhibit, this is the South American Agouti (*Dasyprocta punctata*), which will add activity to the ground floor of the exhibit.

All these species will come together, along with planting to create a natural South American experience. The plants will be mostly hardy South American species, all being non- poisonous so they do not harm the animals. 'Amazonia' has not got a fully covered roof, therefore all the plant species chosen have to be hardy enough to withstand the British climate.

The public will enter 'Amazonia' through a themed entrance where there is going to be a large bird aviary and a new purpose built Caiman exhibit. The large aviary will be a mixed Macaw *Ara* spp. exhibit and the indoor Caiman exhibit will house the zoo's pair of Yacare Caiman (*Caiman yacare*) and this new exhibit has an underwater viewing area and is themed to integrate into 'Amazonia'.

The signage and interpretation throughout 'Amazonia' aims to allow visitors a chance to experience, in their imaginations, what it would be like to visit a South American Tropical Rainforest through a combination of first- hand sensory experiences, coupled with easy to understand interpretative signs. The signs will provide a broad overview of life in a rainforest. The information will be given over a series of signs, including information signs, maps and interactive discovery panels for the public to learn from.

Due to the complexity of the exhibit and possible public interaction with animals, the exhibit will be staffed at all times when open to the public. The staff will be utilised, in that they will monitor animals' interaction with each other and the public, and will give regular educational talks about the species and their conservation status.

## **An investigation of factors that potentially affect eye health of the Malayan Tapir – *Tapirus indicus* in captivity**

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Taronga Zoo in, Sydney, Australia has housed Malayan Tapir (*Tapirus indicus*) since 1996. To date four Malayan tapir have been housed, three from overseas institutions and one calf born at Taronga Zoo. Since arriving in Australia, the Malayan Tapirs have had multiple medical problems including ulceration of oral mucous membranes, skin irritations on their backs, feet and eye problems. Eye conditions have ranged from intermittent corneal clouding to corneal ulceration which progressed on three occasions to rupture of the cornea. This paper will discuss the health problems Taronga Zoo has encountered with Malayan Tapir and the steps taken to rectify these problems.

In order to assess how common the health problems experienced with this species were, a survey was sent out to forty five zoos worldwide which hold Malayan Tapir. Twenty two out of forty five zoos responded. Of the twenty two respondents, sixteen reported eye problems. This paper will also discuss health problems encountered worldwide in Malayan Tapir, and will indicate that further research in this area is needed.

## **Attempted artificial insemination in a giraffe using an endoscope**

*R. Zammit, N. Dunn & L. Vogelneust  
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Giraffe are commonly held in zoos around the world and generally breed well. In order to maintain genetic diversity there is a need to move animals between institutions. However transporting live giraffe, especially adults is difficult. They are large animals and substantial and specialised equipment and facilities are required to accomplish this safely and effectively. It can be stressful and potentially dangerous for the animal. Invariably giraffe transactions are also costly, sometimes many thousands of dollars. One way in which these issues can be avoided is to simply transport sperm rather than the whole animal.

Veterinary and Ungulate staff at Sydney's Taronga Zoo have been working together on a program to artificially inseminate a giraffe. Semen was collected from a male giraffe in Auckland, New Zealand and shipped frozen to Taronga Zoo. For the past few years ungulate keepers have been conditioning Andara, a 7 year female giraffe, for ultrasound examinations and insemination. This involved desensitising her to accept rectal ultrasound examinations and the insertion of an endoscope through her vulva and into her cervix. Rectal ultrasound is required to monitor follicle development and time of ovulation. Ideally insemination must be performed a few hours before ovulation therefore timing is crucial. To synchronise the timing of ovulation Andara was given an injection of GnRH – a hormone that causes ovulation.

As the available semen was of poor quality it was also critical to deposit it within the uterus to ensure a better chance of success. Using this technique (hysteroscopy) semen can be more easily deposited directly into the uterus. The lumen of the giraffe cervix has numerous spirals making the use of standard bovine or equine insemination pipettes difficult. A flexible endoscope allows one to easily negotiate the cervix.

This poster describes our latest attempt at artificial insemination using hysteroscopy.

## **Australasian Keepers Assisting Parrot Conservation in Latin America**

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Australia and New Zealand are amongst the world leaders with regard to active bird conservation, largely due to unique, but often threatened fauna within both countries. While habitat clearance and introduced predators are largely to blame for driving many species to near extinction in Australasia, the effects of illegal trade are minimal. However, the same cannot be said for the bird species of Latin America, where the illegal pet-trade is largely responsible for the decline of many species. Continuous habitat destruction and the poor economies of countries within this region further increase the struggle to conserve these species and the environments they inhabit.

In 2004-05, two keepers from Australasian zoos took their skills and knowledge in bird husbandry and conservation to assist in parrot conservation projects throughout Latin America. The scarlet macaw (*Ara macao*) is the most widely-dispersed of the macaw species, but there are less than 1000 individuals remaining in the tropical lowlands of Costa Rica. The azure wing parrot or indigo-winged parrot (*Hapalopsittaca fuesleri*) of the Colombian Andes cloud forests was thought to be extinct for 70 years, before being re-discovered in 2002.

Amigos de las Aves Costa Rica is a private non-profit organisation, based in Alajuela. Alongside a refuge for injured, orphaned and confiscated Costa Rican native bird species, they also operate captive breeding programs for both of Costa Rica's indigenous macaw species, the scarlet macaw and the great green macaw (*Ara ambiguus*). For the past 5 years, they have been re-introducing scarlet macaws to two release sites, with a success rate of more than 90%.

The Foundation ProAves of Colombia is also a non-governmental, non-profit organisation, focusing its efforts towards the study of birds and the conservation of their habitats through scientific research, active conservation and environmental education. Currently, research is concentrating on Project Ognorhynchus (*Ognorhynchus icterotis*), the azure wing parrot, and the rusty-faced parrot (*Hapalopsittaca amazonia*), but other parrot species are also being investigated.

Both projects present excellent opportunities to participate in valuable conservation programs, but furthermore, allow for incredible experiences in different cultures, amazing landscapes, and the ability to implement all that we learn in often captive-constricted environments to the 'real world'.

## **Behavioural Effects of Auditory Enrichment Associated with Feeding in Captive Serval (*Leptailurus serval*) in New Zealand**

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The provision of auditory stimuli associated with feeding is potentially an effective method of environmental enrichment for captive predators with superior hearing capabilities. This study investigated the appropriateness of auditory stimuli as a feeding enrichment tool for captive serval, by testing its behavioural effects on 6 captive serval in New Zealand. The evaluation was made in the context of the main goals of enrichment, with focus on; whether auditory stimuli in association with food presentation triggered predatory behaviours, whether it increased display of natural behaviours and reduced abnormal behaviours, and how it affected enclosure utilisation. The auditory enrichment provided consisted of a chick chirping sound and a rustling sound, each played inside the enclosures and associated with a food reward. This enrichment effectively triggered predatory behaviours during the play of sound, with non-significant effects on overall natural and abnormal behaviour and enclosure utilisation. This study highlights the potential that auditory stimuli has as a feeding enrichment tool, in allowing opportunities for captive serval to perform certain behavioural needs.

## **Best Practice Capture Handling and Restraint for wildlife Professionals**

*H. Mihailof*

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Animals on Film aim to show best practice capture, handling and restraint techniques for wildlife professionals working in captive or research environments. The education materials are produced by a group of experienced zoo industry personnel with keeping, education, vet nursing, research and film making experience. They have compiled, researched and interviewed recognised experts in the fields of herpetology raptor management and zoonotic disease.

People who work with raptors, snakes and zoonotic risk would find this material useful, either for training new staff such as, Vet Nurses, Zoo-keeper's and Conservation staff or when working with fauna in a field research environment, where trapping, Zoonosis and data collection issues are the focus.

The Best Practice Capture Handling and Restraint DVD & CD Rom pack offers Volume one Snakes showing and discussing both venomous and non venomous species and Volume 4 Raptors. Each volume is offered separately as a double set

comprising approximately 40 minutes of DVD and a CD-ROM manual of 50 pages in Adobe PDF format.

The PDF manual provides the reader with contact details for web-sites, diagrams, equipment and people plus a range of transport information that describes IATA requirements for International transport containers.

Other information comprises animal ethics issues, Zoonosis risks, safety issues and recognising indicators of animal stress when performing procedures.

Subsequent material will offer a comprehensive Zoonoses Reference manual comprising approximately 350 species which are shown in a scrolling excel spreadsheet format. Additional information on Zoonoses and vectors plus quarantine issues and bio-security products provide the reader with accurate information edited by parasitologists and specialist veterinarians.

Animals on Film work in close co-operation with the West Australian -Vet Surgeons Board, Conservation and Land Management in WA, Australasian Society of Zoo Keepers Inc, St. Johns Ambulance Murdoch University WA and other recognised professionals in many areas of specialisation.

We aim to educate best practice in animal management when wildlife professionals work with native or exotic fauna.

### **Contra-freeloading in Captive Serval Cats (*Leptailurus serval*) within Zoos in New Zealand**

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There has been much recent discussion regarding the importance of animals being able to perform behaviours found in the wild. One important aspect relates to feeding and the lack of stimulation, generally, for captive wild animals. The appetitive phase of hunting behaviour in felids can involve locating, capturing, killing and some post-kill processing of the prey. The loss of the ability to perform the appetitive phase of feeding is especially relevant for animals with specialised morphologies, such as seen in the serval. This study investigated the phenomenon of contra-freeloading (choosing to work for food rather than have freely available food) in 5 captive servals and the impact their food preference had upon this. A series of choice tests were utilised using a stretchable cord hung from the roof of the servals' enclosure. All but one of the subjects displayed a difference in food preference prior to the test. The levels of contra-freeloading exhibited by the servals were found to be significant in only one individual (treatment two  $p=0.028$  and treatment three  $p=0.000$ ). Food preference influenced the level of work amongst the subjects such that, of the four servals that exhibited low levels of contra-freeloading, three exhibited significant levels of work (jumping for food) when they were offered their favoured food and the other individual jumped for over 50% of the trials. Although contra-freeloading was

not consistently shown by all of the servals in this study, it was exhibited, and therefore provides a platform for further study into contra-freeloading in captive wild animals.

## **Elephant – Keeper related incidents**

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During 2003 concern was growing in the Asian and African elephant EEP Species Committees and in the British and Irish Elephant TAG regarding the number of recent incidents involving keepers and elephants in European zoos and safari parks. It was therefore decided to send out a 15-part questionnaire to establish whether any common denominators existed. The survey covered the last 15 years, during which time six keepers had been killed and fifty injured.

### **Questionnaire Results:**

A total of 78 questionnaires were sent out with 55 (70.5%) collections responding. Sixteen (29%) of the collections had no incidents but 39 (71%) collections did. If it is assumed that collections which did not respond had no incidents, 50% of collections would still have had incidents, this was not acceptable.

On analysing the sex and species of elephants involved in the incidents, it emerged that female Asian elephants (*Elephas maximus*) were the more likely candidates. This may be because more Asian elephants are kept in zoos and safari parks compared to African elephants (*Loxodonta africana*) and Asian elephant cows are more often kept in 'free contact' situations. On the other hand bulls of both species were generally kept in 'protected contact' or 'no contact' situations. Incidents usually happened in elephant barns and in close contact with other elephants but on only one occasion (that has been recorded) did another elephant join in with the attack.

The incidents more often occurred soon after the animals were taken off chains or at the end of a foot trimming session, possibly when the keepers were not as vigilant as they should be. Incidents also occurred when the elephant was being given a command by a new keeper and the animal did not want to respond.

The age of the elephant or how long it had been kept in the zoo was not a significant factor, nor was the age of the keeper.

### **Significant Factors:**

The most significant reasons for an incident occurring were:

In nearly 50% of incidents the keeper was working alone;

In nearly 50% of incidents the keepers had a maximum of three years experience with elephants (in many cases this was much less);

In many cases the keeper had a maximum of three years experience with the particular elephant involved in the incident (again in a lot of cases this was much less).

Some other factors possibly contributing to incidents were if an elephant was in musth or in pain due to an infected tusk or foot, if the elephant was nervous (either because there was work going on in the barn or it was a new animal) or if there were unusual associated circumstances (for example an elephant was just recovering from anaesthetic)

**Management:**

Two management issues which must be addresses if we are to continue keeping elephants in our collections:

Keepers should never work alone around the animals;

Continued training of all keepers, whatever their experience, is necessary.

**Environment Enrichment: recreating the natural habitation of the gorilla**

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The design of habitat for gorillas has a diverse history and effect on the animal. In most situations, as experience has shown, survival is dependent on the suitability of the habitat. In fact, "an animal cannot be isolated even conceptually, from the particular environment from which it belongs and has become adapted without a serious misunderstanding of its true nature. (Akeley 1929). The relevance of recreating the natural habitat of the gorillas in their captive exhibits cannot be over-estimated.

This paper therefore explores the need to understand the biological and physical needs of the gorilla as learnt from their natural environment with a view to recreating it in their captive exhibit such that management and care as well as survival is ensured. This is based on the view and understanding that sterile environment only heightens boredom and stress with the consequence of general difficulty in management and possible eventual death.

Human toys should be used to encourage play behaviors; exhibit features should compare to the level of complexity and stimuli from the natural habitat and hence promote specie-appropriate behavior.

This paper asserts that, while this is not an attempt to solely totally recreate their natural environment, it advances the notion that the health and sustainability of this animal could be achieved without a totally sterile environment.

Vegetation provides the needed shade or cover, exhibition and foraging stuffs, feeding elements and resting materials, and allows visual cover from other animals and hence promotes specie-appropriate behavior necessary for the animals' well-being and the visitors' education. It is also stressed that the geography and the geology of the exhibit site in terms of the topographic features and rock outcrops should be considered. The deadfall trees can be arranged in such a manner to encourage natural movement and locomotion pattern within the exhibits to stimulate the daily foraging behavior of wild gorilla. Care must be taken however, in arranging furniture for the apes since wrong positioned furniture could be utilized for escape.

This paper concludes that the application of the knowledge of gorilla environment nexus in a recreated manner enriches the total habitat of the captive ape and simplifies management, ensures survival as it lessens risk.

### **Getting everyone on board! Encouraging South African keepers to perform environmental enrichment**

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Environmental enrichment and husbandry training are quickly becoming core components of most keepers' daily routine. Many keepers willingly participate in environmental enrichment activities and have excellent training skills while other keepers may not be so enthusiastic about enrichment and have little or no training background. These gaps in motivation and education can create frustration for other keepers and supervisors and reduce the level of care for the animals. This paper chronicles the 6 environmental enrichment and 2 husbandry training workshops that were conducted by The Shape of Enrichment and hosted by the National Zoological Gardens of South Africa from May 23<sup>rd</sup> through June 10<sup>th</sup>, 2005. Our goals were to encourage keepers to continue with species appropriate enrichment by getting them to think about how they care for the animal in relation to the species natural history, to generate empathy for the animals, to teach some basic animal training and give participants an opportunity to practice enrichment and training. For both the enrichment and training components, we did in-class workshop style sessions and practical sessions on zoo grounds. The response from participants was overwhelmingly positive. Many keepers told us they had never thought about life from the animals' perspective and that the workshop had inspired them to continue with enrichment. At the time of this writing, the enrichment coordinator for the National Zoological Gardens of South Africa is still evaluating the long-term successes of the workshop.

Many of the attendees at the 8<sup>th</sup> International Conference on Environmental Enrichment held in New York, expressed frustration over low staff motivation and lack of education. The type of staff training we conducted could prove to be useful to other institutions.

## **Hailstones & Floodwater: the effect of natural disasters on a Wildlife Sanctuary**

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*Hailstones & Floodwater* is a poster presentation which reviews the history of two dramatic natural events which have affected Currumbin Wildlife Sanctuary over the past several years. From the financial and structural impacts, through to the effects on park animal welfare and staff member morale, this poster intends to sketch out a general outline of the damage such extraordinary weather conditions can deliver.

Utilizing both analytical and anecdotal information, the poster seeks to present our journey of rebuilding and repair, as well as the potential measures of loss prevention for future natural disasters. This information may be useful to other Parks or Sanctuaries who may one day face flood or hail threats.

*Hailstones & Floodwater* intends to provide an interesting, educational and emotive summary of the enormous human effort required during such extreme weather conditions.

## **Harvest Mice, *Micromys minutus*, work at Chester Zoo with the smallest native rodent in the UK**

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This poster describes the work Chester Zoo has done, and continues to do, with this tiny, but charismatic animal. Being just 5 cm long (plus a 5 cm long tail) and weighing just 5 grams, the Harvest Mouse is the UK's smallest Rodent species. Despite its extraordinarily large natural worldwide distribution, there is very little recorded research on this tiny animal, and populations are likely to be fragmented across many parts of its range. It is thought to be declining in the UK, certainly in the north, due to habitat destruction and modern farming practises.

Chester Zoo decided that this fascinating species was deserving of more attention and embarked on a major research programme with the following components:

1. Husbandry Guidelines. A captive breeding programme was established at Chester Zoo and techniques were refined over 10 years, culminating in production of husbandry guidelines to assist other collections with maintaining self-sustaining breeding populations in captivity. This research revealed the previously unrecognised need to offer Harvest Mice a competitive mate-

selection process to form successful breeding pairs, and the critical timing for removal of young from a breeding pair.

2. Status in Cheshire and surrounding areas. Chester Zoo has initiated extensive survey work for Harvest Mice both in Cheshire and neighbouring counties, with input from various partner organisations. This has identified the habitats they currently occupy, but we do not know if these are habitats of choice, or the only remaining options for them...
  - 1998-2000 work with Cheshire Wildlife Trust in Cheshire. Harvest Mice were actively sought throughout the county through live trapping and field signs. Alarming, few signs of Harvest Mice were found and only one animal was caught. Nests were found in wetland and reed-bed areas.
  - 2002-2005 work with the British Association for Shooting and Conservation (BASC) asking landowners if they had Harvest Mice on their land, followed by live trapping in the most likely areas. No animals or signs were found.
  - 2006 work planned with North Wales Wildlife Trust to survey for Harvest Mice in North Wales.
3. Reintroduction Protocol. Chester Zoo has conducted experimental releases using 'soft' and 'hard' release methods, and radio tracking of animals. Populations resulting from these experiments have been/will be monitored for four years to assess the success of the techniques used. This work will produce a draft reintroduction protocol for the species should reintroduction ever be required in the future. This research is likely to be relevant to reintroduction projects with other small rodents. Throughout this research IUCN Re-introduction Guidelines have been followed at all times.

### **Husbandry improvements for ocellated turkey (*Agriocharis ocellata*) at the Dallas Zoo**

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Ocellated turkeys (*Agriocharis ocellata*) are making a comeback in North American zoos. Previous attempts at captive management of the species were not particularly successful, due to poor egg and chick viability and medical and parasite issues. During the past four years, the Dallas Zoo has refined many aspects of ocellated turkey husbandry. Incubation success has increased to approximately 80% and trends in hen fertility and egg viability have been identified. Malpositions causing late shell death continue to be the main cause of egg mortality.

Hand-rearing diets have been fine-tuned to reduce growth and developmental problems. Previous difficulties encouraging poults to eat on their own have been eliminated, as have metabolic bone disease concerns. Poults often hatch with about 5mm of primary wing feather growth in preparation for flight by day 7. Angel wing

(drooped or flipped wing primary tips) still occurs at day 2 or 3 requiring 24-48 hours of taping for permanent correction. Future assessments of adult diets will be made to determine if there is a correlation. Poulting rearing diets are based on 26% protein commercial turkey crumbles supplemented with finely chopped greens and insects.

Ocellated turkeys are usually skittish and their flight response can be violent and result in mechanical injuries or death. Restraint techniques have been adjusted to decrease inherent stress, which can also cause sudden death during routine handling. Substrate modifications have limited parasite exposure and poults are now maintained on concrete until approximately eight months of age. Adult birds appear to have less parasite susceptibility.

Continued attention to all aspects of ocellated turkey captive breeding has resulted in improved husbandry and viability in all age groups. These colorful and ornamented turkeys are becoming visitor favorites and are reappearing in zoological collections across North America.

### **Husbandry Techniques used to improve the breeding success of the Helmeted honeyeater *Lichenostomus melanops cassidix* in captivity.**

*B. Manning*  
*Healesville Sanctuary, Australia*

Honeyeaters are a large family of birds restricted to the Pacific region. Australia is well endowed with honeyeaters, with every location in the country having at least one species. The critically endangered helmeted honeyeater is one of four subspecies within the yellow-tufted honeyeater group. It is also a Victorian faunal emblem. Formally distributed from Healesville to south Gippsland, the last naturally occurring population of helmeted honeyeaters is now restricted to the riparian forest surrounding Yellingbo, where there are currently only seventeen breeding territories, and possibly less than 100 individuals.

The formation of a Recovery Team in 1989 was quickly followed by the establishment of a captive population at Healesville Sanctuary, Australia, with the first captive-bred helmeted honeyeater being born in September 1990. The next captive breeding did not occur until the 1995-96 breeding season, co-inciding with the establishment of the studbook in order to better manage the population. Currently there are 32 adults in captivity, including two pairs held at Taronga Zoo, New South Wales.

The captive breeding of the helmeted honeyeater continued steadily from 1996 - 2002. The past four breeding seasons, however, have shown a remarkable increase in the captive program. Significant changes in the husbandry of the species, combined with the implementation of new techniques have seen the "egg to fledging" rate climb from 13.5% in 2000-01 to 44% in 2004-05, but peaking at 60% in 2003-04. This poster will illustrate the varying methods trialed throughout the 16 years of the recovery program, focusing on those practises that have resulted in the increased success of the past four years.

## **Immobilization of wild equidae with medetomidine-ketamine at Chester Zoo**

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Historically immobilization of wild equidae has been performed with a number of different agents. Medetomidine, medetomidine-ketamine and atipamezole were first used in non domestic species at Helsinki and Kolmarden zoos in 1986. We describe here the use of a medetomidine-ketamine combination in twenty anaesthetic procedures at Chester Zoo between 2001 and 2005.

Twelve different animals (5 Persian Onager, 6 Prezwalski wild horses and 1 Grants zebra) of varying age (4-22yrs) were anaesthetized using a medetomidine-ketamine combination delivered by remote dart. Initial dose rates of medetomidine varied from 0.0977 to 0.3 mg/kg. Initial dose of ketamine varied from 1.34 to 3.4 mg/kg. First effects were seen within eight minutes of darting. In uncomplicated cases recumbency was seen within six to eighteen minutes. Four cases had a protracted time to recumbency (greater than thirty minutes) and received additional doses of medetomidine-ketamine. Recumbency was achieved in all but one case.

Quality of induction was generally good with four of twenty classed as poor. These included the three that had protracted times to recumbency and one other that required a second dart after kicking its initial dart out and receiving a partial dose. Throughout the procedure medetomidine-ketamine or ketamine top ups were administered as required. Myorelaxation was classed as fair to excellent in all cases.

Four of the twenty procedures were for the purpose of euthanasia. Thirteen of the remaining sixteen animals anaesthetized received atipamezole either intramuscularly or intravenously at a dose of between 0.469 to 1.24 mg/kg. Recovery to mild sedation was achieved within eight to thirty five minutes. Mild sedation was classed as the animal standing quietly in the enclosure. Assisted recoveries were attempted in a number of cases by holding the animal down until strong attempts to stand were made. This appeared to be of benefit.

We conclude that medetomidine-ketamine combination is a relatively safe, reliable and humane method of anaesthesia for wild equidae in a zoological collection. This poster was first partially presented at a meeting of the Association of Veterinary Anaesthetists in Vienna during April 2005.

## **'Long Distance Relationships Do Work!'- Auckland Zoo's Female Asian Elephants Contribute to International Research Project**

*Elephant Management Team  
Auckland Zoo, New Zealand*

Key words: free contact, research, collaboration, New Zealand.

Auckland Zoo's female Asian elephants are managed in a comprehensive free contact program. This enables the reliable and co-operative collection of temporal gland secretions (TGS), vomeronasal organ secretions (VNO), trunk mucus and urine samples for the chemical communication research project in collaboration with Prof. L.E.L (Bets) Rasmussen, OGI School of Science & Engineering, Beaverton, OR, USA and David R. Greenwood, Mt Albert Research Centre, Auckland, NZ.

## **'Looking After Our Own' Chester Zoo's Native Species Conservation Work**

*S. Bird, Biodiversity Officer, North of England Zoological Society  
Chester Zoo, United Kingdom  
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Introduction:

Through involvement in UK conservation projects Chester Zoo demonstrates that its mission to save wildlife and habitats is as important here as anywhere in the world. In fact, the most significant impact we can have on survival of biodiversity globally is through the way we look after our 'own back yard'.

In the UK Chester Zoo works in partnership with many conservation organisations including Wildlife Trusts, English Nature, Countryside Council for Wales, and the Environment Agency. Our input ranges from advice and funding to practical help both here at Chester Zoo and out in the field. We are working with threatened species, important wildlife habitats and community wildlife groups. The poster gives brief details of six UK species conservation projects in which Chester Zoo plays a practical role.

Projects described:

Black poplar (*Populus nigra subsp betulifolia*)

Chester Zoo co-ordinates the local Biodiversity Action Plan (BAP) for Black Poplar in Cheshire. Action includes recording and monitoring trees, propagation, awareness raising, and providing advice to tree owners, and planners etc.

Harvest mouse (*Micromys minutus*)

Chester Zoo's work with this species over more than 10 years has contributed significantly to captive care, breeding techniques and knowledge of the biology of these mice.

Freshwater pearl mussel (*Margaritifera margaritifera*)

Chester Zoo is working with partners to conserve these mussels. The Freshwater Pearl Mussel, a UK BAP species, is presently under serious threat in most of its range and classified *Endangered* on the IUCN Red List.

Sand lizard (*Lacerta agilis*)

Chester Zoo became involved in captive breeding and reintroduction work with Sand Lizards in 1995 in partnership with the Herpetological Conservation Trust, English Nature, the Countryside Council for Wales and WWF. The species is threatened throughout much of its range, and is a UK BAP species.

Hazel dormouse (*Muscardinus avellanarius*)

In England this species is thought to have become extinct in half its former range in the last century. Cheshire is part of the English Nature reintroduction programme; dormice were released in the county in 1996/97. Chester Zoo has initiated a project to individually mark animals at this site, and those at a natural population in NE Wales. The Zoo provides the veterinary expertise to microchip the animals and manages the data collected.

MacKay's horsetail (*Equisetum trachyodon*) and Isle of Man cabbage (*Coincya monensis*)

Chester Zoo holds insurance populations of both these UK BAP species in cultivation. The Zoo has both species on public display and interpretation is in progress.

### **Never a Dull Moment**

*K. Hedges, C. Holsheimer  
Marine Mammal Trainers, Sea World, Australia*

At Sea World Australia we have a diverse facility which gives us the opportunity to provide a combination of environmental enrichment and behavioural enrichment to our pinniped collection.

We would like to share some of our experiences from taking our performance seals to bow ride with the dolphins at Dolphin Cove to park walks with the guests. In our Animal Care Division the staff are able to provide a program of enrichment which is not only mentally stimulating for the animals but also encourages natural behaviours which in turn creates an improved public perception and increased viewing time.

At Seal Theatre the animals have a multitude of choices from day to day penning to deciding which bed to sleep in at night. We are able to transport the animals to different areas of the park which increases trainer rapport and provides invaluable desensitization as well as giving our guests a value added experience.

There rarely ever is a dull moment and as animal care professionals we are able to provide an ever-changing environment whilst maintaining a working routine around shows, programs and educational presentations.

## **Nile hippo training for blood collection**

*D. Gould, Animal Keeper, K. Harvison, Vet Technician  
Oregon Zoo, United States of America*

The protected contact training program for 0.2.0 hippos at the Oregon Zoo has evolved from simple behaviors to a goal of voluntary blood draws. Some of the behaviors the hippos have learned include: “target,” “over,” “chin up,” “back” and “open”. They have been conditioned to accept: touching all over their bodies; tourniquets on their ears; needle pokes; mouth inspections and tail lifts. Medical procedures, especially anesthesia, can be very difficult and dangerous to both hippos and staff. The use of operant conditioning has been an invaluable tool allowing us to monitor the health of these animals while increasing staff safety.

## **Obesity in captive Big Cats**

*L. Ginman (BSc)  
Unit Supervisor carnivores  
Taronga Zoo, Sydney, Australia*

Caring for animals in captivity poses many challenges that the keeper/animal manager must solve. There are spatial, behavioural, psychological, environmental and husbandry issues that we face. In the modern zoo we have a greater knowledge and understanding of both the physical and psychological well being of the animals in our care. We provide larger and more natural exhibits, and where possible natural social groupings are mimicked. Keepers provide behavioural/environmental enrichment to stimulate our captive animals who are generally confined to the same space day after day and year after year. Big cats have not been left behind in the move towards a modern zoo. In a recent paper by this author, a survey was conducted to examine current management practices of big cats in both Australasian and northern hemisphere zoos. A total of 19 zoos participated in the survey and included data from 10 species of big cats. One section of the survey focused on diets and weight monitoring. The survey revealed that approximately 30% of big cats currently held were considered to be overweight/obese based on both photographic evidence and statements from the replying institutions.

This paper discusses the issue of obesity in big cats, its long standing physical effects, recognising obesity and recommend preventative measures so that our captive cats can shed the kilos and resemble the lean predator of their wild relatives.

## **Observations on Breeding and Hand-Rearing Cuculidae at the Zoological Society of San Diego**

*A.L.Beutel, Avian Propagation Center  
Zoological Society of San Diego, United States of America*

The 28 genera and 136 species that make up the family Cuculidae are remarkably variable in their social behaviour and parental care. The brood-parasitic cuckoos lay their eggs in the nests of other species and never raise their own young. Nevertheless, despite the notoriety of the brood-parasites, most species of cuckoo live in pairs and regularly raise their own young. With a distribution that is cosmopolitan the cuckoo is an inhabitant of mostly forests and woodlands.

The family Cuculidae is poorly represented in zoological collections in the U.S with the exception of the Greater Roadrunner *Geococcyx californianus* There is little captive husbandry data available for this group.

The Zoological Society of San Diego has kept five species of the family Cuculidae; Greater Roadrunner *Geococcyx californianus*, Renault's Ground-cuckoo *Carpococcyx renauldi*, Chestnut-breasted Malkoha *Phaenicophaeus curvirostris*, Red-billed Malkoha *Phaenicophaeus javanicus*, and Crested Coua *Coua c. cristata*.

This poster will review the San Diego Zoo's techniques for breeding Chestnut-breasted Malkoha, Red-billed Malkoha, Crested Coua and Renault's Ground-cuckoo. The paper will also describe the methods used for artificial incubation and hand-rearing of these species.

## **Post-release survival and movements of harvest mice, *Micromys minutus*, in relation to reintroduction method**

*E. Kean, Research Department, North of England Zoological Society  
Chester Zoo, United Kingdom  
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Harvest mice numbers are thought to have declined in Cheshire and could be in decline nationally. This is thought to be due to modern agricultural practices. Chester Zoo has had a captive breeding programme for this species for around 15 years. In 2002 and 2003, releases of captive-bred harvest mice were conducted in order to produce a harvest mouse reintroduction protocol, should there be the need for reintroduction in any area of the species' range in the future. The aims of this study were a) to investigate if acclimatising animals in the release field prior to release, known as 'soft release', improved reintroduction success, b) to see if males and females differed in their survival and movements post release and c) to find if there is an optimal weight at which harvest mice should be released. To do this, 20 of the 268 mice released in 2003 were radio collared. The radio collars had a battery life of

approximately 20 days. Within the radio tracking period, nine mice were confirmed dead, four considered dead, and signals from five were lost before the battery ran out. There was no significant difference in survival time between hard and soft released mice ( $p=0.829$ ) or males and females ( $p=0.229$ ). Time spent at release point before initial dispersal did not differ significantly between hard and soft released mice ( $p=0.058$ ) or males and females ( $p=0.269$ ). There was no significant difference in dispersal between hard and soft released ( $p=0.173$ ) or males and females ( $p=0.936$ ). Weight before release was not correlated with survival ( $p=0.936$ ). Live small mammal trapping continues at both sites for more long term monitoring of the releases. In October 2005 harvest mice were trapped in both release fields. Results from the radio tracking are preliminary and more research is needed to improve the release protocol.

## **Sierra Club's Global Population and the Environment Program**

*C. Salopek, Volunteer Activist  
Sierra Club, Illinois Chapter  
Chicago, United States of America  
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The Sierra Club is America's oldest, largest and most influential grassroots environmental organization. The Club's Global Population and Environment Program works to inform the public about population-environment connections and to motivate citizens to take action in their communities. The Program's mission is to protect the global environment and preserve natural resources for future generations by slowing population growth and reducing wasteful consumption.

Our planet is now home to more than 6 billion people - with a projected 50% increase in the next fifty years. The rate at which we consume and degrade natural resources jeopardizes the health of the planet and threatens the availability of clean water and clean air for generations to come. Human activities are affecting species of all types and habits, and pushing many toward extinction. We have an opportunity and a responsibility to address these long-term challenges. With almost one-half of the global population under the age of 25, the choices families make today will have a tremendous impact on the future.

The Sierra Club's Global Population and the Environment Program seeks to accomplish its mission by promoting voluntary domestic and international family planning programs and reproductive health services; encouraging the public to support providing women and girls access to basic rights, including healthcare and education; and encouraging people to reduce excessive consumption and live in ways that have less impact on the earth's resources.

## **The Evolution of an AAZK Funded Environmental Education Project in Uganda**

*M. Stern<sup>1&2</sup>, R. Goldstone<sup>1</sup>*

<sup>1</sup>*Kibale Community Fuel Wood Project, Uganda*

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In 2001, the Kibale Forest Education Project (KFEP) was created to teach local students about the amazing biological wealth of their National Park. As reported at the 2004 National Conference of the American Association of Zoo Keepers (AAZK), over 850 students from five schools participated during the project's first year, taking day-long trips to experience the forest and meet its inhabitants. Since that time, the project has and continues to undergo a remarkable evolution. Under the auspices of the Jane Goodall Institute (JGI), Ugandan teacher Margaret Kemigisa expanded the project to include eight schools. Over 1,000 students were brought to visit Kibale in 2003 and 2004. Unfortunately, JGI was forced to abandon the project in late 2004. Undaunted, Ms. Kemigisa continued to educate local citizens about the park. Working without a salary, she established environmental clubs and organized environmental rallies at local schools and formed a women's craft group that utilizes sustainable resources from around the park. With support from the Puget Sound Chapter of AAZK, Ms. Kemigisa started seedling nurseries at local schools to teach sustainable methods of growing fuel wood. Presently, wood and charcoal are the sole sources of energy for 98% of people surrounding Kibale. It is worrisome that the major benefit of the National Park sited by locals is the illegal collection of wood from within its boundaries. Armed with the experience and relationships gained through its development, KFEP is now poised to begin a new incarnation as the Kibale Community Fuel Wood Project. A collaboration between local citizens, Chimp-n-Sea Wildlife Conservation Fund, McGill University [and numerous AAZK chapters – pending], the project will establish tree nurseries and actively promote the creation of private woodlots. Through an educational outreach program, the project seeks to enhance appreciation for the National Park while teaching and encouraging the use of environmentally sustainable practices. By creating a legal wood source to satisfy human needs, the project will better protect the natural forest and improve park-people relationships, helping to provide a more secure future for both wildlife and humans.

## **The Hand Rearing of an Elephant Calf At Whipsnade Wild Animal Park**

*A. Kenyon, Elephant Section*

*Whipsnade Wild Animal Park, United Kingdom*

[elewhip@yahoo.co.uk](mailto:elewhip@yahoo.co.uk)

This poster is based on the elephant section at Whipsnade producing its first live Asian elephant calf. For various reasons the female calf didn't suckle properly, so the

section staff had to resort to hand rearing. This has only been successfully achieved within the western hemisphere on two other occasions (to our knowledge). The poster portrays various stages of Emilia's life from her birth up to the present day and the problems the staff encountered and overcame. Thanks to help from various sources worldwide and large amounts of time and persistence from the Whipsnade elephant staff our female elephant calf has reached two years of age. We continue to monitor her health on a daily basis.

## **The Key to Keeping Kea:** **Kea Enrichment and Conditioning at Auckland Zoo**

*M. Whybrow*  
*Auckland Zoo, New Zealand*

The kea (*Nestor notabilis*) is a bold, intelligent, mischievous and unique bird. The only alpine parrot in the world, it is restricted to mountain areas of the South Island of New Zealand.

In the past, captive kea have been prone to stereotypic behaviour such as pacing and head flicking due to lack of stimulation and boredom. Boredom affects both physical and mental health and captive institutions must find alternative stimulation for their animals' wellbeing.

It was with this in mind that Auckland Zoo's Native Fauna Section developed both a training and conditioning program and a behavioural enrichment program for their kea.

Enrichment motivated by food, that encourages the birds to explore their environment and use their intelligence to solve problems, goes some way to minimising boredom and other problems associated with a captive environment. The Zoo's kea were already offered an ad lib supply of browse and mulch, food items were scattered or hidden, and they were occasionally given novel objects. A more comprehensive program was wanted.

Another form of enrichment is the training and conditioning of the kea. This program was started to assist with the daily husbandry of the kea, to stimulate them mentally and to develop and present a kea encounter. This encounter would involve an informative talk to the public and show them natural behaviours exhibited by kea. Once keepers have caught the audience's attention and empathy, important conservation messages about this species can be delivered.

Since these two programs have been implemented, behavioural studies have shown an increase in desirable activities and a decrease in undesirable behaviours. I believe the programs have most definitely enriched the lives of our kea and would not hesitate to recommend other kea and parrot holders to do the same for their animals. The above information is depicted as a series of two posters.

## **The North of England Zoological Society Research Programme**

*S. P. Hill, Research Officer, Chester Zoo, United Kingdom*  
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Good quality research has an important role in modern zoos, as well as being a legal requirement. The North of England Zoological Society (NEZS), based at Chester Zoo, UK, is committed to research as part of its mission to support and promote conservation of plants and animals, as described in this presentation. In 2004, over 200 research projects were carried out at the Zoo by academics, students and Zoo staff, in a variety of basic and applied fields and this continues in 2005. Biological studies are carried out on diverse topics including elephant birth behaviour, nutrition of equids, genetics, studbook analyses of animal populations and the effects of various husbandry practices such as enrichment efforts on animal welfare, using a range of non-invasive measures. Education and marketing research projects are also conducted, such as evaluations of Winter Presenter Talks and their efficacy in educating visitors about animals, assessments of visitor satisfaction of their Zoo trip, and Annual Membership and staff surveys. In addition to its on-site research programme, the NEZS supports in situ research through various channels including financial and staff technical support for NEZS conservation programmes, grants and studentships, some of which are undertaken in conjunction with conservation partner organisations. The NEZS coordinates several in situ conservation programmes, which include large components of research. For example, the Jaguar Programme incorporates PhD research and is an investigation of jaguar-rancher conflict in South America, and the Asian Elephant Programme is a study of human-elephant conflict using Geographical Information Systems as a research tool. In 2005, research at Chester Zoo is thriving and interest is being shown by art and photography researchers, as well as scientists, in conducting projects at the Zoo. In this poster I present the holistic possibilities for zoo research efforts and how the NEZS uses these to try to achieve its conservation goals.

This abstract and poster are reproduced with kind permission from the organisers of "Animals and Zoos: Current Research Focus," held at Poznan Zoo, Poland, May 2005. This abstract previously appeared in Hill, S.P., 2005. The North of England Zoological Society Research Programme. In P. Cwiertnia, E. Zgrabczynska, J. Ziomek and R. Ratajszczak (eds.), Proceedings of the II International Conference: Animals and Zoos, Current Research Focus, 24-25 May 2005, Malta Training Centre. Poznan, Poland: Ogród Zoologiczny w Poznaniu. P. 61.

## **The preservation and management of Koala genetic diversity using reproductive biotechnology and molecular genetics: A model for endangered Australian marsupials**

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The Koala is arguably Australia's most iconic and endearing species, so that there is considerable public demand (national significance) and expectation for both its conservation in the wild and exhibition in zoological institutions. With increased fragmentation of Koala habitat, it is becoming increasingly important to take action in genetic management of these populations in order to avoid genetic drift and inbreeding depression. There has also been an increased demand for the international transfer of "disease free" Koalas to international zoos. Currently, the transfer process is expensive and there are animal welfare issues associated with transport of live animals. Assisted breeding technology, including semen cryopreservation and artificial insemination, offers a real alternative to the traditional methods of Koala genetic management. The future genetic management of Koalas will most likely involve the use of genome resource banks in which Koala gametes can be safely stored frozen for hundreds of years and subsequently thawed and used in artificial insemination programs; such programs provide an important insurance policy against the loss of heterozygosity and in some extreme circumstances (e.g. if the effects of global warming are worse than predicted), the whole species. Whilst the Koala is not currently classified as endangered, it has been scheduled as vulnerable in the southeastern bioregion of Queensland and in New South Wales. The collection and storage of genomic material from rare and endangered species confers substantial advantages in the preservation and genetic management of captive populations of Australian marsupials. Although the promise of this technology is significant, testing of genome resource bank principles and large-scale use of the concept in wildlife populations throughout the world is limited to only a handful of species. However, artificial insemination in the Koala using fresh semen is now almost routine, so that the Koala represents an ideal prototype to establish a specific genome resource bank for a marsupial. The collection and cryopreservation of Koala semen from genetically important populations and its subsequent use in artificial insemination programs provides a vital new tool in the preservation and management of biodiversity in Australia and represents a world first in terms of a large scale proactive strategy in the conservation of a marsupial.

## **The Shape of Enrichment: A valuable resource for zoo keepers**

*B. Hammond, Workshop Trainer and North American Video Librarian, M. Rich,  
Workshop Trainer and Enrichment Construction Specialist  
The Shape of Enrichment, San Diego, California, United States of America*

The Shape of Enrichment is a private, not-for-profit educational organization dedicated to encouraging environmental enrichment for all captive animals. To achieve our goals, we publish The Shape of Enrichment, a quarterly document focused on the exchange of enrichment ideas for animal caretakers. Anyone may write and submit an article. There is a review process and usually almost every article is accepted. The subscription price is \$16.00 USD per year but if someone writes an article, they receive a free subscription for one calendar year. We also maintain, with the support of AAZK, enrichment and training video libraries on 5 continents. The available titles are published in the Shape of Enrichment and an abbreviated list is on the Shape of Enrichment website, [www.enrichment.org](http://www.enrichment.org). Anyone can request to borrow up to three titles at one time free of charge. The videos are mailed out and the borrower can keep them up to 1 month. The only cost to the borrower is to mail the videos back to the library. The Shape of Enrichment team also conducts environmental enrichment and training workshops. We have traveled to Asia, South America and Africa to engage and encourage keepers to create, administer and evaluate environmental enrichment. We volunteer our time since we all feel strongly committed to sharing and encouraging environmental enrichment. The Shape of Enrichment has many resources available for keepers who want to learn, share and encourage others to strive for high quality animal care.

## **The use of synthetic appeasing pheromone to reduce anxiety in a male Polar Bear (*Ursus maritimus*)**

*\*K. Haynes-Lovell<sup>1</sup>, P. Sebastian Mynott<sup>2</sup>, P. Pageat<sup>3</sup>*

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*<sup>3</sup>Pherosynthese Research Centre, France*

In 2004 two male yearling Polar Bear cubs were introduced into the collection at Polar Bear Shores, Sea World, Australia. The cubs were orphaned at a young age and transferred from the Quebec Zoo in Canada.

Polar Bear Shores already housed a captive bred four year old brother and sister. The four year old male, Lyutyik, was to be transferred to a facility in the USA, however the required documentation and availability of a suitable space took considerable time to organise. During the period that all four bears were housed at the Sea World facility Lyutyik had an increased instance of anxious behaviour. It is believed that the presence of the two younger males was the catalyst for this anxiety. As we were unable to move Lyutyik until all documentation was complete we investigated methods to assist Lyutyik cope with the changed social dynamics at the facility.

Dr Patrick Pageat from the Pherosynthese Research Centre in France supplied a mammalian de-specified appeasing pheromone (MdAP) to assist Lyutyik.

The poster will present the positive findings of this experiment in the use of synthetic pheromones to reduce anxiety in an Ursid species.