

Measuring Emotion at the Zoo

Indigenous Knowledge and  
Conservation Education

Catalysts for Conservation  
in the 21<sup>st</sup> Century

# IZE

journal



## A note from the IZE President

### Stephen McKeown

HEAD OF DISCOVERY AND LEARNING |  
CHESTER ZOO | UNITED KINGDOM



When I was a six year old at school in Scotland, our class teacher, Mrs. Abercromby, told us the story of the Miracle of the Quails where the Israelites in the desert, desperate for meat, came across flocks of quail which they captured and ate. I remember, along with the rest of my group, the Golden Eagles, being very impressed indeed with this particular miracle.

On being asked to draw pictures of the event, we all set to work with our wax crayons and, acting on zoological guidance from me (I'd had 'Animal Lotto' for Christmas so was considered an authority) happily produced 30 pictures of ravenous Israelites throwing spears at whales floating just above the desert sands. Mine had been snared by giant volleyball nets and Moses was approaching brandishing a chopper. Not one of the Golden Eagles knew what a quail was and we were sure the teacher had said, or must have meant whales. Not a great start for a zoo educator to be but it illustrated to me at a tender age the potential for people to misunderstand en masse.

We could, no doubt, fill this journal several times over with stories from our own zoos of our visitors getting the wrong end of the stick but it seems to me our time would be better spent on that fundamental of education, establishing what people already know and building on it. If Mrs. Abercromby had asked us what a quail looked like she would have immediately realized we had no idea – and I would have been deprived of the opportunity to repeat the story forty years on. But how much time do we spend on finding out what visitors already know? And is it really time well-spent?

Well, the potential for disaster is huge – we may think we know our audiences but if we proceed too far on the basis of assumptions we will sooner or later hit a barrier. Whatever the vehicle we are using to deliver our messages – signage, public presentations, audio-visual shows, animal demonstrations, web pages – I believe we should always test it beforehand. It needn't be a costly or time consuming exercise. We have in the past done mock up signs complete with flaps attached by sticky tape and walked around testing them on visitors, quickly realizing that the way we were presenting some key ideas wasn't really working for the majority of people. And that's important – for some stuff you're never going to achieve 100% understanding and it's not necessarily because some people are stupid – it's more to do with the information sets we have in our heads (I know very little about football, knitting or the succession of the Stewarts but am still considered to be reasonably intelligent). So you need to decide at which percentage of your sample you achieve a critical mass of understanding that you can run with that version. I will also mention here the importance of random sampling. Unless you properly randomize your sampling you run the risk of biasing the results. At a simple level, if wandering around choosing people to test are you more likely, even subconsciously, to approach more approachable looking people?

I'm sure some of you are thinking, well we're too busy for all that stuff but I have seen numerous cases in my own zoo and in others where pre-testing of e.g. interpretation has saved money and time (because you don't have to go back and re-do something that you find isn't working).

So this is really a short but impassioned plea for zoo educators to think a lot more about evaluation and pre-evaluation of their offerings. There is a growing body of literature, some of it in back issues of this journal, showing how you can do it and we hope to add more material to the IZE web site on the subject.

Thank you all again for supporting IZE by being a member and I'm looking forward to seeing some of you at least in Adelaide!

## Editorial

### Natasha Silva

SENIOR EDUCATION  
OFFICER | ARTIS ROYAL  
ZOO | THE NETHERLANDS



Modern zoos increasingly focus their operation on the survival of endangered animals and their ecosystems. Nevertheless, zoos have abandoned the idea that they are a modern Ark of Noah, realistically only being able to be instrumental in saving a handful of endangered species. Increasingly, the key purpose of modern zoos is education, more specifically Conservation Education.

Zoos are becoming proactive 'learning institutions', valuing knowledge and a diversity of perspectives. The ideally intelligent, decisive and innovative zoo manager must take a holistic approach to the numerous characteristics which shape zoo space and define them in relation to the zoo's primary objectives: conservation, scientific and educational efforts. This includes reacting appropriately to societal trends and change. Thus, contemporary zoos are increasingly being incorporated into the Experience Economy. Visitors crave not only experiences, but especially attractions which inject emotions into their offers (and with almost 150 identified emotions, that's a great range to choose from...).

Zoo education is progressing accordingly; its not only about action through learning, increasingly educators are discovering the impact of emotions and their effect in sustaining deep learning and creating memorable experiences.

Will future zoos not only be about offering rich, authentic and memorable experiences, but especially about supporting the individual (inner) transformation of their visitors?

Will visitors entering future zoos be affirming their citizenship to environmental awareness and will zoos become a consumer location for a kind of ecological conversion?

Charlotte Lind with Banksia, the golden brushtail possum (*Trichosurus caninus*)



Photo © Currumbin Wildlife Sanctuary



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The IZE is an association dedicated to expanding the educational impact of zoos and aquariums worldwide. Its dual mission is to improve the education programs in the facilities of its members and to provide access to the latest thinking, techniques, and information in conservation education.

The IZE Journal is a medium for promoting the IZE mission and highlighting conservation education trends, initiatives, efforts and achievements of IZE members.

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- 02** A note from the IZE President | Editorial
- 03** Contents
- 04** Zoos... Catalysts for Conservation in the 21<sup>st</sup> Century?
- 06** Mixing Marketing and Education
- 08** Conservation Education and Community Pride
- 12** Conservation Campaigning through Animal Training
- 14** A New Chapter in Conservation Education in the Cayman Islands
- 18** Engaging the Community in Our Work
- 23** The Center for Animal Research (CIA)
- 27** Measuring Emotion at the Zoo
- 32** Honouring Indigenous Cultural Perspectives for Sustainability Education
- 36** Catalyst for Structural Change in Small and Mid-Size City Zoos
- 40** Who Needs a Species Label?
- 44** Indigenous Environmental Knowledge
- 47** Wild Carnivores: From Conflict to Tolerance

# Zoos...

## Catalysts for Conservation in the 21<sup>st</sup> Century?

by Dr. Chris West CEO | ROYAL ZOOLOGICAL SOCIETY OF SOUTH AUSTRALIA

### WHY DO ZOOS EXIST?

The conference held in London in 2003 and entitled "Zoos in the 21st Century: Catalysts for Conservation?" had one very simple aim; to affirm that the fundamental role and justification of zoos is to act as powerful centres for conservation. Zoos operate across a range of activities and skills and have a unique attraction and huge global audience and so their potential to complement other environmental and conservation organizations is immense. The question is how to realize this potential..... In addition, we need to check that all zoos are committed to the same cause and this issue is not mentioned to be divisive or judgmental rather to be clear that our local and global reputation and perceived value rests on an absolute integrity. We can all think of institutions and past circumstances where a semblance of zoo activity and claims of conservation value have been exaggerated and are simply part of a sort of cryptic

strategy to secure commercial benefits. False and cynical claims and unacceptable standards of care are still a major threat to conservation zoo credibility.

### DO ZOOS DO WHAT THEY CLAIM?

And are they all performing effectively and efficiently? There is a great need for evaluation and prioritization tools to demonstrate real impact. In other walks of life there are methods of evaluation and they may be somewhat imperfect but they allow for an objective review of how well a collective enterprise is doing against its stated targets. Zoos are no different and need to be able to satisfy themselves and external financial supporters that investment decisions are valid. Work done by the CBSG Field Projects Prioritization Group and the EAZA 'satellite group' in Copenhagen is beginning to provide a pilot tool for us to evaluate long term, often complex and multi-partner programs.

Experiencing a python up close.



## HOW TO ENGAGE PUBLIC INTEREST...

Over some years the acceptance that there is a biodiversity crisis has been growing, perhaps at least from the inception of WWF and its panda logo by Peter Scott. But nevertheless there is still a crisis of understanding and then commitment to conservation action amongst the wider public. This is about the interdependence of the environment, ecological health and biodiversity and the ultimate sustainability of human development in terms of quality of life overall and not just in bald economic and prosperity values.

One of the Catalysts for Conservation themes was to do with Conservation Psychology which is the study of what, how and why people think and feel the way they do about conservation and what zoos can do to use this insight to modify individual and collective attitudes and behaviours. We talk about advocacy and inspiration but we need to do this with compelling arguments and a sense of cultural sensitivity and at an emotional as well as rational level.

## ...AND NOT TURN PEOPLE OFF

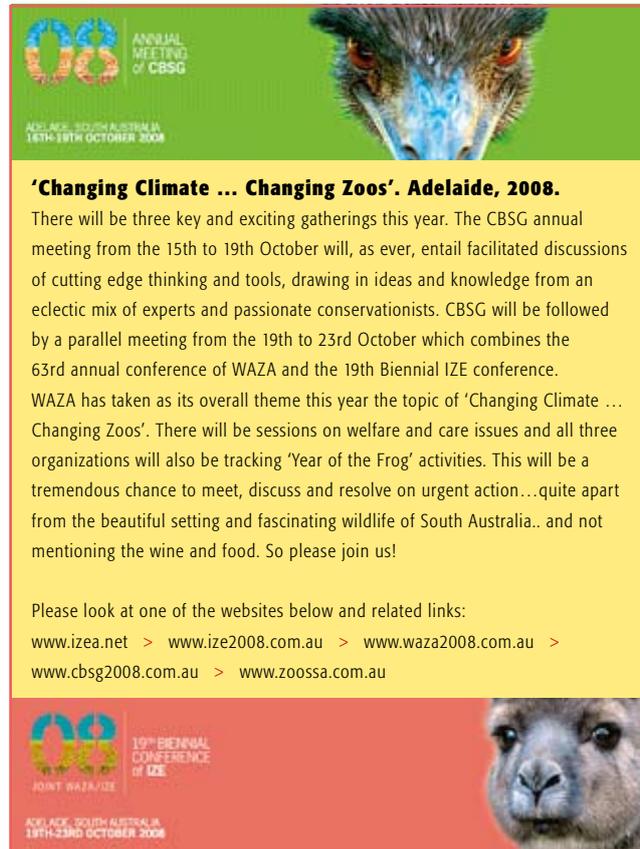
Of course one factor which obstructs any empathy and support of zoos is in the realm of the ethical and humane care of animals. Zoos will forfeit any claim to be ethical organizations trying to achieve conservation as a moral imperative if they demonstrate less than total integrity and the highest standards of animal care in all they do.

## GLOBALLY THINGS ARE GETTING WORSE

Since the Catalysts conference in 2003 and the publication of the book in 2007, the previous horsemen of the apocalypse of habitat destruction, over exploitation of natural resources, invasive species, pollution and emergent diseases have been joined by a huge new one the impact of which threatens to dwarf all the others. This horseman is called "climate change" and so now a new challenge is for zoos to consider what and how they can help with species survival in the face of unprecedented rates of habitat impact in situations in which animals cannot migrate. The urgency of the situation seems at variance with the reluctance of all of us from citizens through to political leaders to make the hard decisions to avert the worst.

## THE FUTURE OF ZOOS

Zoos are many things and have often been thought of as hybrids of business and mission/vocation led organizations. Now perhaps the imagery best used is that of field hospitals in a war zone, or refugee centres, trying to salvage species in the face of terrible threats and competing needs.... as with the Year of the Frog and the essential role of captive management.



**'Changing Climate ... Changing Zoos'. Adelaide, 2008.**

There will be three key and exciting gatherings this year. The CBSG annual meeting from the 15th to 19th October will, as ever, entail facilitated discussions of cutting edge thinking and tools, drawing in ideas and knowledge from an eclectic mix of experts and passionate conservationists. CBSG will be followed by a parallel meeting from the 19th to 23rd October which combines the 63rd annual conference of WAZA and the 19th Biennial IZE conference. WAZA has taken as its overall theme this year the topic of 'Changing Climate ... Changing Zoos'. There will be sessions on welfare and care issues and all three organizations will also be tracking 'Year of the Frog' activities. This will be a tremendous chance to meet, discuss and resolve on urgent action...quite apart from the beautiful setting and fascinating wildlife of South Australia.. and not mentioning the wine and food. So please join us!

Please look at one of the websites below and related links:  
[www.izea.net](http://www.izea.net) > [www.ize2008.com.au](http://www.ize2008.com.au) > [www.waza2008.com.au](http://www.waza2008.com.au) >  
[www.cbsg2008.com.au](http://www.cbsg2008.com.au) > [www.zoossa.com.au](http://www.zoossa.com.au)

We still must support the security and sustainability of as much wild as possible. After all the WZACS definition of conservation is all to with population and habitat in the wild.

But zoos can also be something else and must act as beacons of hope too in the midst of possible despondency and defeatism. Zoos are community centres, windows onto vanishing worlds, places where city dwellers go to recharge their batteries and reconnect (even if only subconsciously) with nature. Zoos have teams of education and inspiration experts and can offer life-changing experiences to people of all ages. Zoos and the people who run them have a choice in how the world turns out for our children and their children in turn. Do we reinforce and redouble our 'refugee' support? Yes of course! Do we learn more about and redefine ourselves in terms of our education and inspiration impact? Yes of course! Do we believe in ourselves and so we care enough? Do we have the collective resolve across our many nationalities and cultures?

Let us make sure we do...! ♦

### REFERENCE

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# Mixing Marketing and Education

in Johannesburg Zoo to the benefit of the 2008 The Year of the Frog campaign

by Louise Gordon EXECUTIVE MANAGER MARKETING AND EDUCATION | JOHANNESBURG ZOO | SOUTH AFRICA

**In 2006 the Education Department married the Marketing Department. Amidst horror-stricken faces, furious frowns from both sides and the ever-knowing nodding heads of those who knew it would not work and some positive thoughtful faces, we forged ahead ... and with great result.**

Reasons why we took this drastic step included the size of our visitor numbers – ranging from 400,000 to 500,000 annually not to mention the fact that we have a very limited budget for both entities. The Education budget could be likened to an anorexic cheetah – very fast to spend and nothing but skin and bone.

The marketing budget did not do much better. Marketing has always been below the line and dependant on public relations. Both departments were focusing on the same target group and both shared similar functions – so we thought – make them one. It has not been without its challenges but has worked remarkably well for a number of reasons. The one case study to share would be the global frog campaign.

## Frogging it

When the Johannesburg Zoo decided to sign up for the 2008: Year of the Frog, we got all excited – hopped and skipped around like nobody's business. Reality soon set in: we had no extra budget to do anything spectacular. One of our greatest resources was the fact that the Zoo had already started on a frog conservation programme in 2006 and the frog breeding centre was well set-up and had already started to draw some national and international attention.

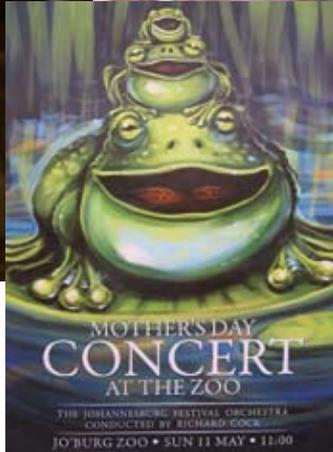
The question still remained – how do we get people excited about frogs?

Another reality is: you don't get people excited about frogs in general. People either like or hate them but more often actually THEY DO NOT CARE.

## Our action plan worked as follows:

The *education* section designed an educators resource book, an educators training session, a learners training session and resources for learners. The Discovery Centre was turned into a "from rivers to oceans" display, focusing on the importance of clean water for all life. The DVD presentation in the Discovery centre shared some views on pollution, litter, the importance of water and frogs. All learners that visit the Zoo (annually approximately 120,000) are invited to explore the Discovery Centre free of charge. The Zoo educators set themselves the tasks of designing information sheets on frogs and their plight and these are handed out to all people who attend school sessions, visit exhibits on and offsite of the Zoo and the information is inserted in all promotional packs. Frog information is displayed at our curio shop and at all the administration buildings and in some of the public toilet blocks. The educators resource book has been distributed to all interested zoos and aquaria in South Africa free of charge.

The *marketing* heads got together and since we could not afford to pay for advertising nor arrange events specifically for this cause, we allocated space on our public bill boards announcing the Year of the Frog.



All events were flavoured with frogs: Biodiversity events were linked with frogs such as Water Week in March, The Sasol Bird Fair in May (some owls and other birds eat frogs, etc), World Environment Day on 5 June focusing on global warming and how it effects frogs to up coming events such as Arbor Day in September and how frogs need trees.

Normal public events such as our Mothers' day concert (11,000 people attended this) had posters with mommy frogs and their babies displayed round the Zoo. In actual fact the exact poster looked more like frogs locked in amplexus.

The value of linking the frog theme with our entire events plan meant that the media picked up on the frog theme and used it quite successfully in the sponsored advertising campaigns. In the media campaigns it was mentioned that you could get much more information free of charge from the zoo and its educationists.

Public value added programmes such as our 'adopt an animal' programme had special rates if you wanted to adopt frogs in our Zoo. The adoption promotions took place at all of the previously mentioned events. Frog stickers were printed and these were handed out with each adoption.

Public exhibitions were focused on frogs. Our Horticulture Department participated in a gardening exhibition off site. Their theme: you guessed it – frogs in your garden. The education section participated in a science fest off site – focused on frogs.

### Having a common goal

The plan may sound very familiar to you as you may be in the fortunate position of having a Marketing Department who likes to make use of education



programmes for marketing and who work hard at promoting education in your facility. This was never the case in Johannesburg Zoo. We always had a tug of war kind of relationship with the educationist – fiercely purist and wanting to make sure all were properly educated. Awareness was simply not enough. The Marketing department always knew that people should have fun – not be schooled all the time and that people were not attracted by pure education themes.

In our case we are all thinking of frogs – whether it is to educate, raise awareness, get a picture in the paper with a frog and a famous person, or arrange radio interviews. The main focus is frogs and the two sections, now one department has a common goal and work well together.

Lessons learned: you do not need a lot of money to participate in global campaigns; you simply have to recognize the opportunities within your own organisation to participate. ♦

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See the Johannesburg Zoo website [www.jhbzoo.org.za](http://www.jhbzoo.org.za) for a breakdown of the structure of their Marketing and Education Department.

Visit [www.izea.net](http://www.izea.net) to see what other IZE members are doing to raise awareness of the Amphibian Crisis.

# Conservation Education and Community Pride as a Tool for Protecting Mamize Nature Reserve, Sichuan Province, China

by **S.M. Bexell** (DIRECTOR OF CONSERVATION EDUCATION), **R.X. Feng** (PROGRAM MANAGER), **Z.H. Zhang** (DIRECTOR) CHENGDU RESEARCH BASE OF GIANT PANDA BREEDING | CHINA, and **M. Esson** EDUCATION PROGRAMMES MANAGER | CHESTER ZOO | ENGLAND

**Increasingly the major zoos of the developed world seek to evidence their contribution to conservation by involvement in *in situ* projects, through both financial and technical support (Gerritsen 2004; Mohan *et al.* 2004; Sheppard 2002). Technical support can include transferable skills, for example animal husbandry or veterinary procedures, and education. However, it is important to recognize that education must be culturally relevant to be effective (Alasuutari 1996) and cannot be directly 'exported' in the same way. This paper discusses the significance of integrating socio-cultural aspects into conservation education programming.**

To contribute to conserving the habitat of the giant panda (*Ailuropoda melanoleuca*) and the biodiversity of the region, the Chengdu Research Base of Giant Panda Breeding has joined forces with other institutions and nature reserves in developing a culturally relevant conservation education programme in one of the 50 giant panda reserves in China, namely Mamize Nature Reserve.

The World Zoo Conservation Strategy urges zoos to embrace the concept of conservation coalitions using the wide range of conservation tools at their disposal (WAZA 2005). The collaborative effort for Mamize is partnered by Chester Zoo (North of England Zoological Society, NEZS) whose mission is 'To be a major force in conserving biodiversity worldwide.' The Chengdu Panda Base, NEZS and Liverpool John Moores University (LJMU) have a long established partnership for wildlife conservation in Sichuan Province.

Mamize was established in 2001 as a county level Nature Reserve and in 2003 as a provincial reserve. It is a 300,000 hectare reserve located on the border

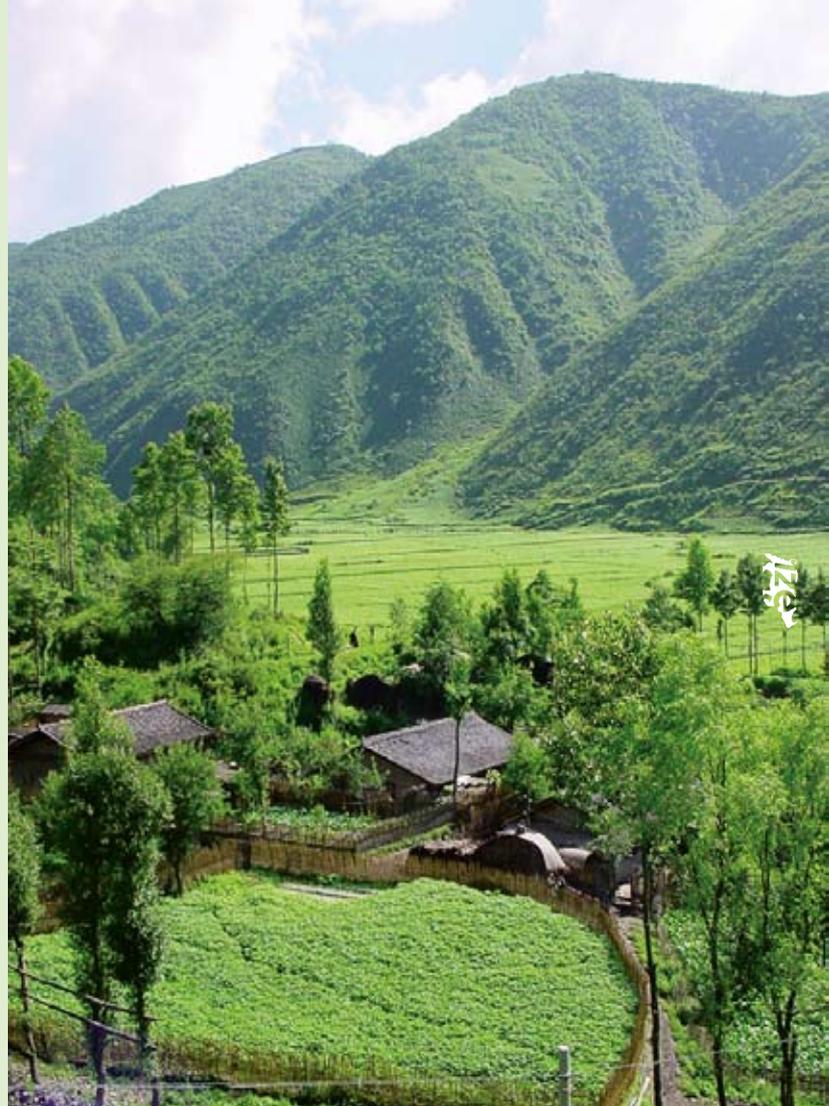
of Sichuan and Yunnan Provinces. There are currently circa 10 giant pandas in Mamize according to a 2004 survey. In the 1980s there was only one giant panda in the area. Reserve staff believe this low number was due to logging. There are two panda reserves adjacent to Mamize and pandas have been flowing from them to re-populate Mamize.

Giant panda habitat, including Mamize Nature Reserve, is located within one of the 34 biodiversity hotspots in the world as defined by Conservation International. Biodiversity hotspots are areas on Earth that are of highest priority for conservation action and investment; they contain high species diversity and endemism, and are fragile and highly threatened (Myers *et al.* 2000). Habitat protection is paramount in saving endangered species and a critical component of habitat conservation is education. Conservation education is increasingly recognized as one of the critical components of conservation action plans to preserve life on Earth (Orr 2004). Many of the problems associated with habitat and wildlife threats stem from the practices of those communities living on the fringes of conservation areas (Adams 2007). The education imperative also extends to people who





Captive giant panda Er Yatou with her cubs.



Gu Dui Village in the Valley.

may visit nature reserves or purchase items derived from reserves (Daltry *et al.* 2001). Unlike some nature reserves in China that have been used sustainably by local people for countless generations, giant panda habitat – including Mamize – is considered to be too fragile for even minimal use (Xu and Melick 2007).

The Chengdu Panda Base was established in 1987 with the sole purpose of increasing and stabilizing the captive population of giant pandas through research. As this effort began to show success, in 2000 we established the first functioning conservation education department in a zoological facility in China. With seven years of development of programs and most importantly staff training and development, including staff training with the Education Division at Chester Zoo, we expanded our efforts to include *in situ* conservation with the ultimate goal of habitat preservation and growth of the wild population of giant pandas. This goal requires the efforts of many individuals and institutions with differing areas of expertise. Prior conservation work for Mamize mainly focused on habitat assessment and species monitoring, primarily of birds. NEZS staff, as well as

scientists from LJMU and Sichuan Forestry Administration, were interested in adding an education component to their conservation efforts.

### Needs assessment

In June 2007, with a grant from NEZS, staff of the Chengdu Panda Base conducted a qualitative needs assessment with the staff of Mamize Reserve, the nearby school in Gu Dui Village, and local people to

Chester Zoo hosted Chengdu Panda Base educators – Xu Ping and Feng Rui Xi – for professional development and international exposure to the field of conservation education.



investigate how conservation education might fit into the conservation goals of the reserve and needs of the local people. We needed to understand the conservation threats in the area, local customs, education system, and learn the conservation goals of the Reserve in order to decide upon strategies that would most benefit the situation in Mamize. We learned that this area is dominated by the Yi Minority and soon found that as outsiders, being American and Han Chinese, we were not trusted and would need to have a Yi person on our team in order to be successful. We also learned that there was a great deal of local pride in the land and wildlife, and fear of outsiders coming in and destroying the land and poaching animals and plants from the Reserve.

Discussing cultural story, especially cultural views of wildlife.



Through a series of interviews we gained an initial overview of how local people used the forest:

- The primary threats to the Reserve are: collection of medicinal plants and roots, firewood, and bamboo shoots, and “ecotourism” a highly misused term in China. What actually takes place is that urban people go into natural areas for recreation because of beautiful scenery and cool weather and the number of people coming each year is increasing. They harm the areas through uncontrolled visitor numbers, littering, fires, noise, collection of plants and more often than not, buying souvenirs and meals that are derived from nature reserves.
- The main sources of income in the area are: 1) crops and fruit; 2) livestock, including sheep, ducks, pigs, chickens, and goats; 3) leaving the village for work in cities; and 4) collecting medicinal plants from the forest. Local people are also paid by the government to re-plant the area with trees. Unfortunately, only one species of pine is being planted. Mono-culture replanting is not habitat restoration, so not useful to local species or the health of the environment which also impacts local people (Conservation International 2007).
- Reserve staff do not believe that the taking of

medicinal plants is too harmful because they are plants and they will grow back. However, a human presence in the forest may disturb animals. Also, the taking of plants and animals from biodiversity hotspots is a threat to those ecosystems (Conservation International 2007). The dilemma is that the local people depend on the funds they receive for selling medicinal plants and herbs. If in education programs we advise not to take medicinal plants or animals from the Reserve, we must help people develop an alternative source of income.

- With financial support from its Chester Zoo partners, the Reserve has begun to develop community projects in order to improve the lives of local people living in and around the reserve. For example, villagers in Gu Dui have been provided with a clean water supply via the provision of stand pipes in prominent places around the village. Unfortunately local people either do not seem to be aware of the Reserve’s support for this or they do not see it as a significant advantage as the local people told us that the Nature Reserve is not a benefit for them. Before it was established they could collect more medicinal plants and cut trees to increase their income. Since the Reserve was established their income has decreased. There are also wild pigs that destroy their crops. More work is therefore needed to improve the effectiveness of community projects and ensure that local people make the direct connection between the presence of the reserve and improvements in local living standards.
- Local people have a positive relationship with the forest. The Yi Minority traditionally has a taboo against hunting some animal species, which affords a great deal of protection to wildlife. When asked why local people think pandas are important they said that pandas do not destroy crops or hurt people, as is the same with most wild animals. The local pride in their natural heritage is strong and should be motivational in wanting to conserve their natural resources.
- Many minority cultures in Southwest China have hunting taboos and conservation and social scientists advocate conservation programs that use an integrative approach that includes local people and heightens their self-interest and promotes protection of their traditional lands (Xu, Ma, Tashi, Fu, Lu, and Melick 2006). A great deal of indigenous knowledge in this region of the world places a high value on protecting forests, sacred sites, and water resources while protecting biodiversity (Xu *et al.* 2006).



Building on the results from the needs assessment, the conservation education components of the project were established to include several inter-related aims:

- to provide engaging experiences that allow local people to participate in conservation planning
- the maintenance of indigenous knowledge and stewardship practices
- to provide alternative resources so that the local people need not depend on the direct resources of the reserve.

### Outcomes

We learned that conservation education is not only culturally sensitive from country to country, but also between regions of the same country. Consequently we have hired a Yi person to facilitate trust and help in our investigations and design of appropriate education tools. We have designed and conducted an initial training in conservation education content and methods for local school and reserve staff. Our next steps in conservation planning for Mamize are to learn more about Yi culture, learn about appropriate community sustainable livelihood programs and garner funds to begin these initiatives, study the local government structure, investigate the extent of collection of medicinals, firewood, and hunting, and promote pride in local customs and how land has traditionally been used. Finally, we will conduct a conservation campaign for the area, including conservation education programs and sustainable livelihood development.

Education and conservation campaigns have a significant role to play in bringing about changes in wildlife conservation (dos Santos and Blanes 1999; dos Santos and Blanes 1997). At the same time, promoting public participation in conservation decision-making and providing alternative livelihood choices are critical for a healthy future. International NGOs may be eager to conduct conservation education projects in developing nations but often find it hard to adapt resources and techniques to local needs. We are

utilizing funds and relevant skills from international organizations, but using in-country and local knowledge and skills to develop our project with cultural sensitivity. We hope that utilization of in-country knowledge and skills will allow us to develop our project quickly, more efficiently, and in a culturally relevant manner to benefit both people and biodiversity. ◊

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For more information see:

<http://www.chesterzoo.org/WhatWeDo/Field%20Programmes/China.aspx>

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# Conservation Campaigning through Animal Training

by **Brendan Host** KEEPER | TARONGA CONSERVATION SOCIETY | AUSTRALIA

**In January of 2007 a new conservation campaign was incorporated into the running of the Free Flight Bird Show of Sydney's Taronga Zoo, Australia, by trainer Claudia Bianchi. Utilising parrots, donations were collected by beak and placed into specially designed moneyboxes to raise much-needed funds for the zoo's *in situ* Little Penguin Breed and Release Program. As of the beginning of 2008 nearly AUD\$40,000 has been raised.**

The Free Flight Bird Show at Sydney's Taronga Zoo has always aimed to inspire its visitors by demonstrating the amazing natural abilities of predominantly Australian species. It has strived to instil an understanding and greater respect for native wildlife and hopefully influence the attitudes of zoo guests to live more environmentally sustainable lives.

To encourage greater support of *in situ* conservation programs and action behaviours by our visitors, in January of 2007, a new initiative was incorporated into the daily running of our shows by trainer Claudia Bianchi. Through positive reinforcement parrots were conditioned to accept donations and place them into specially designed boxes, all money raised directly supporting conservation efforts – in this case the breeding and release of Little Penguins into Sydney Harbour.

Newman accepting money.



This concept was observed at the 'Birds of the World Show' at the State Fair of Texas. Ravens and crows were chosen as the process replicated the natural behaviour of food caching exhibited by these species. During an internship with Natural Encounters Inc. in 2005 Claudia was given the opportunity to explore ways of bringing this form of conservation campaigning back to Australia.

Whilst general opinion suggested that ravens and crows would be more efficient and therefore suitable for this routine over other species, Taronga Zoo decided to utilise parrots instead. This was because there were parrots already available within the collection that weren't being used for show specific routines, so training could commence immediately.

The candidates chosen for the program were a Galah and White-Tailed Black Cockatoo. Both birds had a history of being conditioned for relatively simple behaviours however neither had undergone training involving shaping of complex behaviours. The behaviour proposed by Claudia required the birds to sit on a donation box with a perch and accept money in their beak from the fingers of zoo crowds one thousand strong. It would also require these individuals to become desensitised to the post show environment consisting of moving crowds, music and the free flight of other conditioned birds.



IZE

Training commenced on 23rd of February 2006 using sunflower seeds as a primary reinforcer and a verbal bridge 'good' as an indicator of when the current desired behaviour was exhibited. Voluntarily touching a currency, picking it up, holding for extended periods of time and placing the currency in a container were the steps outlined in the training plan.

This behaviour was then transferred to the donation boxes and desensitisation to the routine environment occurred.

The main issues encountered were desensitising the parrots to the donation box and environment, an ongoing issue as our show evolves and new birds are introduced, and breaking the undesired behaviour of flicking away money once picked up by our White-Tailed Black Cockatoo. But to the merit of Claudia and all trainers' involved success was achieved in January 2007.

As of the commencement of 2008 this venture has raised nearly AUD\$40,000 dollars for the Little Penguin insitu conservation project. Whilst it has become apparent the rate at which parrots collect and cache money is slower than ravens and crows this has not detracted from the overall project but amplifies the intimate encounter experienced by donating visitors.

With Taronga Zoo focusing on influencing our visitors to take action for conservation this project provides our visitors with an opportunity to donate on site, taking action immediately after an inspirational experience such as the Bird Show. Our aim is that this will go a long way to changing our visitor's values and long term behaviours. This is a truly practical example of how a simple idea can effectively instil a change of attitude for a better tomorrow. ♦

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Marco undergoing initial training.



# A New Chapter in Conservation Education in the Cayman Islands

## The new Cayman Turtle Farm at Boatswain's Beach

by **Geddes Hislop** CURATOR FOR TERRESTRIAL EXHIBITS & EDUCATION PROGRAMMES | BOATSWAIN'S BEACH/CAYMAN TURTLE FARM | GRAND CAYMAN, CAYMAN ISLANDS

**The government-owned Cayman Turtle Farm on Grand Cayman has recently expanded its operations to include new nature/culture Exhibit Park with an overlying Cayman/Caribbean theme. The Education Programmes Unit at the new park is working to change public perception of the facility as merely a commercial venture and to establish its place as a local resource and authority on environmental conservation.**

The Caribbean's newest theme park, Boatswain's Beach, is an expansion of the renowned Cayman Turtle Farm (CTF) on Grand Cayman in the Cayman Islands. The new Boatswain's Beach (BB) is determined to be viewed as more than a just a zoo or theme park attraction. A coordinated and cooperative approach to public education is an essential ingredient in achieving this objective. The maxim of the two-year old facility can be summarised as "Conservation through Research, Release, Education and Utilisation".

In keeping with the park's motto, vision and mission statements, promoting conservation through public awareness is at the forefront of the park's programming. Having the CTF, the world's largest and only commercial sea turtle farm, as a central feature of the park

means that the issue of protecting endangered species is always at the forefront.

Using the approach that "Everyone is an Educator"; the Education unit works closely with all departments in Boatswain's Beach to practise conservation awareness both at work and at home. Office practises such as reusing one-side printed paper, and turning off lights when leaving offices can be carried from work into the homes. In this way the message continues to be passed on.

Conservation issues vary in their significance, but tend to be fairly similar across the Caribbean region. In the Cayman Islands, the main issues relate to land development, exploitation of limited natural resources, and protection of endangered & endemic species. In an environment with limited land space and resources housing a growing population and economy, conservation education of local community needs to be a persistent, multi-tiered approach. At the BB Park, the majority of the effort is directed towards the school age populace. Overseas tourists still account for the largest visitation numbers to the park, the majority being short-stay cruise ship passengers. For this target group, the message is simple and to the point: "If you enjoy your visit, then learn more and become better informed, so you can make educated decisions that can positively affect our natural resources".

Marine biologist conducts a Shark Class at Boatswain's Beach







#### Education Programmes at Boatswain's Beach:

- The **Annual Turtle Release** has been a major public event in the Cayman Islands since the early 1970's. Each November a number of farm-raised turtles are released publicly by luck of the draw. This event is widely promoted and scheduled on the Cayman tourism events calendar, offering an unsurpassed opportunity to educate and emotionally involve large numbers of the wider local community as well as overseas visitors in the subject of sea turtle and marine conservation. Along with the free public release, individual and corporate sponsored turtle releases occur throughout the year.
- **Sponsor-a-Breeding Turtle**: The concept is utilised by zoos and aquariums around the world, but is still fairly new in the Cayman Islands. The project has been designed so that both local and overseas sponsors can avail themselves of the opportunity to become more directly involved in conservation of an endangered species. Individuals in the breeding herd of 500 green turtles (*Chelonia mydas*) housed at the CTF Breeding Pond may be sponsored. All sponsors receive the usual background information package on their charge along with personal audio-visual presentation and further information on sea turtle biology and conservation, including simple actions that empower the individual to become more

conservation active. The first turtle sponsored under this project was by a local private school. Interestingly, since that occurrence was published, much more local corporate interest has been forthcoming.

- **Keeper Talks** at the new park are revised and refined to become better oriented to the non-scientific general public. Presenters are all qualified biologists using live exhibits, and delivering talks that inform and help the public to relate to the animals and their environment, convey the message that conservation involves everyone, and finally empower with action steps. Current presentation topics include: "The Truth about Sharks", "Meet the Endangered

Park visitors at the Caribbean bird keeper talk.



A high school education tour.



Visitors enjoy the Education Center.



- Cayman Iguanas” and “Meet the Birds of the Caribbean”. Talks on marine turtles are presented by trained tour guides. Future presentations currently being developed include endemic and native plants.
- **School Tours** since the 1970's were traditionally limited to recreational class outings or short field trips to identify turtle or reptiles for Science class at Primary school level. Today's structured education approach utilises scheduled Keeper Talks, wider in-house staff expertise, as well as facilities of a dedicated Education Center to design field assignments, tours and presentations to meet the requirements of the National Curriculum – all with an underlying conservation message. There was a definite challenge for the BB programme to attract the High School/teen age faction; traditionally an elusive age group as far as partaking in environmental/conservation efforts. In order to resolve this, the park's Education programme charter was expanded to include real world High School level subject material for Biology, Chemistry, Social Studies and Mathematics. Combined with the distribution of a Teacher's Resource List, this approach has met an enthusiastic response from the local High School community.
  - The **Annual Summer Camp** is fast becoming a popular venue for interactive learning and entertainment. The underlying message is “Each one, tell one”.

The camp agenda is being revised such that at the end of each week-long programme, the campers are given the opportunity to become tour guides themselves and share their new found knowledge with visitors to the park. No formal measurement of the effectiveness has been done, but informal observations have noted a profound positive impact on the attitudes of both visitors and their minute guides to share what they have learned.

The current Education Unit staff is two persons, including the Curator and Education Officer. The “Everyone is an Educator” approach has proved to be a successful strategy that maximises personnel and resources, allowing everyone to become involved and share their expertise. The Education Unit is currently in the process of producing publications and developing BB certification courses in environment and ecology. As the programme develops, the next step will be to publish more research, implement and collaborate on community outreach projects, and devise teacher training forums, all to help continue to introduce the conservation message deeper into the Cayman community. ♦

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For more information on the Cayman Turtle Farm and Boatswain's Beach visit <http://turtle.ky> and [www.boatswainsbeach.ky](http://www.boatswainsbeach.ky)

Education officer Sasha Appleby conducts a Q&A with a local primary school.



A primary school education tour.



# Engaging the Community in Our Work

## a successful school zoo partnership model

by **Lian Wilson** (LEARNING EXPERIENCES MANAGER) and **Shelley Waldon** (EDUCATION OFFICER) MELBOURNE ZOO | AUSTRALIA

Engaging students in real life and meaningful learning experiences, as well as allowing them to take ownership of their learning, is a challenge teachers are tackling through the implementation of the new curriculum in Victoria. Teachers are encouraged to integrate learning across the traditional learning areas. An equal challenge from a zoo perspective is how we engage students in our work so that a visit to a zoo is not seen as merely a fun day out of school or stand alone activity, but an important and relevant learning experience, supporting our vision and mission.

Primary school students tending to their browse plantation with the Zoo horticulturist.



Menyaru, one of Melbourne Zoo's orang-utans that this project connects students to.



**H**ow do we offer educational opportunities that genuinely fulfil the zoo's vision of building enduring relationships between people and wildlife for a future in which humans live in balance with the natural world? How can zoos meet these two needs? One solution is for zoos to develop a long-term partnership with school communities involving students in their work. This then raises another pertinent question: how can zoos develop a genuine long-term partnership, without it becoming time-consuming or losing its relevance? The answer is to find something for which the zoo has an ongoing need for assistance, without which the need could not be met. For Melbourne Zoo, in a restricted urban setting, that was a large-scale browse plantation project for additional primate nesting material.

### **The Orang-utan Browse Plantation Project**

The Orang-utan Browse Plantation Project is a sustainable partnership with schools to grow and harvest browse plants for the enrichment of Melbourne Zoo's orang-utans. The project is sufficiently flexible to allow for schools with small urban garden spaces to those with 10,000 trees in acreage plantations. A strong curriculum is incorporated to underpin and support the project to ensure that the growth of plants is not a stand-alone activity. Educators at the zoo support students and teachers in planning authentic learning experiences that address local and global biodiversity issues. A flow on benefit of the project is that through connecting with the zoo's orang-utans, students are more engaged to learn about local and global biodiversity issues and take action towards effective solutions.

The Orang-utan Browse Plantation Project was piloted with five schools for two years and shown to be a highly successful and innovative partnership model, with demonstrated improvement in student learning, attitude and behaviour change. From 2008 the project takes place over a two-year period where Melbourne Zoo and the partner school commit to work closely together to establish the ongoing project. This initial project is then replicated on a two-year cycle for partner schools, where students previously involved in the project are able to mentor their new cohort of students with the support of Melbourne Zoo.

### **How did we do it?**

The project was initiated when the needs of multiple areas of the zoo coincided – the education team wanted to take on the role of extending the learning beyond a stand alone visit, primate keepers wanted a larger source of nesting browse to enrich the primates' lives and horticulture was restricted with space in an urban zoo to grow sufficient nesting browse. From initial discussions, the education team put together a joint project with the Horticulture department to develop and coordinate partnerships with interested schools to grow appropriate browse plants to be regularly harvested for the zoo's orang-utans and other primates.

Students planting browse plants at their plantation.





The schools were offered a complete package, which underpins the learning potential of project participation, by providing curriculum resources which are scaffolded to enable students to connect with wildlife, better understand the natural world and be inspired to act to create a sustainable future.

### **What is involved in the project?**

Once schools register for the partnership, an educator and primate keeper visit the school to generate enthusiasm for the project, engage the student's interest in orang-utans and establish the purpose of the browse plantation. Horticulture staff can also attend to assist the school in selection and preparation of a suitable site for the plantation.

The focus of the first year is on developing skills in horticulture and commencing the design, planting and site maintenance of their plantation garden. At the start of each year the zoo runs professional learning sessions for teachers on 'Green Gardening for the Future', skilling teachers in creating green spaces, site analysis, planting regimes, propagating skills and on-going garden maintenance. Back at school, students learn propagating skills from their teachers and plant out their developed or propagated plants in prepared garden or plantation areas in their school or community. Schools concurrently undertake a unit of work on endangered species in South East Asia to give context to the project and leverage off their initial connection.

Students visit Melbourne Zoo to participate in an educator led learning experience 'Planet Keeper' using orang-utans as a flagship species, to investigate and learn about biodiversity issues. Students are continuously involved in plantation maintenance and have the support of the zoo horticulture team for the first harvest of any fast growing plants.

In the second year the focus shifts to harvesting the browse and developing ongoing plantation maintenance. Students are involved in ongoing propagation of plants and extension of plantation if space permits. Schools are encouraged to bring small groups of students to the zoo to deliver the browse to the primate keepers and if possible see the orang-utans utilising their browse. Students investigate their local environments, learn more about key threats to their local habitat and take action to raise awareness and improve biodiversity. Leveraging off students skills and knowledge gained in local biodiversity issues, schools are engaged in investigating ways of supporting conservation in South East Asia. Students plan ways of raising community awareness and relevant actions they can take to support wild orang-utans in their habitats.

Teachers from partner schools are supported through curriculum materials, such as an endangered species teacher resource book, 'Planet Keeper' teacher resources and pre and post evaluation and assessment activities, which have been developed by zoo educators.

## What were our goals for the partnership and did we achieve them?

One of the important objectives for the pilot project was to validate the effectiveness and sustainability of this partnership project. Our success in this goal was measured through the five pilot schools all signing agreements to become ongoing partner schools with the zoo. Additionally for the official launch of the project in 2008 we have another two schools committed, bringing our total to seven partner schools.

### The goals for the project are:

- To facilitate opportunities that encourage change in beliefs, attitudes and behaviour, thus empowering students and their communities to take action and make a difference in their world;
- To encourage schools engaged in this project to explore local habitat issues and leverage off their students' skills and enthusiasm to participate in local community, environmental and conservation programs;
- To encourage schools to explore and take action for global habitat issues.

To evaluate our effectiveness each year Pre and Post Project Assessment data was collected from teachers and students to assess our goals and specifically skills and knowledge of students, conservation action, both local and global and shifts in belief and attitudes.

Project assessment data showed positive shifts in:

- Learning gained about orang-utans and other endangered species and threats to wildlife (see Figure 1);
- Attitude in the belief that children and individuals can make a difference (see Figure 2);
- Belief system and attitude regarding conservation issues and the importance of wildlife and habitats.

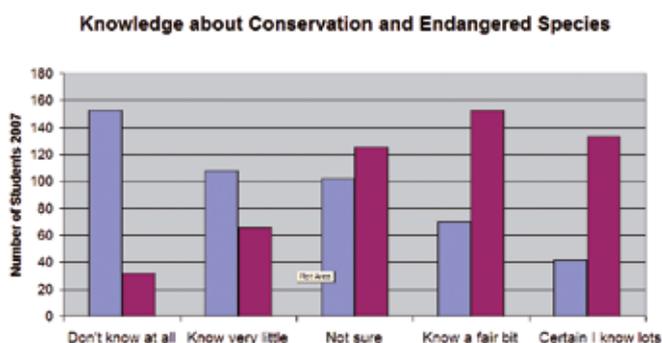
Teacher evaluations of the project have commented on the pride and interest generated by participation in the project with demonstrable flow-on effects to individual student's commitment to their own learning and willingness to attempt other subjects they find difficult, such as maths.

This project, owing to its unique nature, has generated a lot of interest in the school communities. Students are proud of their role in supporting the zoo and wildlife conservation. Schools have profiled their plantations and involvement in local newspapers, school newsletters, and official garden openings with one school's plantation receiving a Highly Commended in Victoria's School Garden Awards. For the zoo this exposure is valuable in promoting awareness of the importance of wildlife conservation.

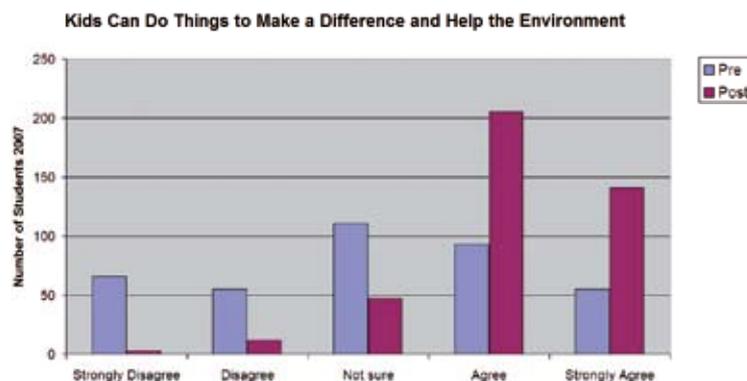
Through the different learning opportunities available, this project has shown that it is effective in fostering behaviours and attitudes sensitive to conservation. Schools are empowered to take ownership for how they will raise awareness and take action for both local and global biodiversity issues. On a local level, two partner schools made links with local municipal environmental officers and plant nurseries for support with area-specific, sustainable plant selection, propagation and preparation of plants for their plantations. These schools also held discussions with local landowners and farming communities that wish to participate in the project, agreeing to donate part of their land for indigenous revegetation plantations with the additional purposes of creating wind breaks and wildlife corridors for native species, which they will both maintain and harvest for zoo browse.

On a global level each school has chosen different paths to raise awareness and take effective action; including running a community awareness campaign in a local shopping centre, newspaper and school

**Figure 1.** Research into knowledge gained about conservation and endangered species from this project.



**Figure 2.** Research into the belief that kids can make a difference and help the environment from this project.



website, creating information displays for public forums, petitions against inappropriate palm oil plantations, raising funds for FFI Sumatran Conservation Project, and students using their own initiative to raise money and sponsor orphaned orang-utans in Indonesia. Each of these schools has demonstrated positive attitudes change to conservation through the belief that communities can make a difference.

### **The vital ingredients for a successful zoo school partnership**

The elements that are essential in creating and maintaining a successful zoo school partnership start with gaining the support of the whole zoo. There are a multitude of opportunities and needs within any zoo, but the best ones for a holistic partnership are when cross departmental needs are met. The commitment of various departments across the zoo was essential for the success of this project.

The next crucial element is to find something that is relevant for schools, and will engage students. For this project the relevance lay in creating green spaces and improving biodiversity in school grounds. Additionally incorporating an iconic animal, such as an orang-utan, is vital for increased student engagement.

It is also important to create rich and rewarding learning resources to entice teachers. This project supports teachers to deliver the curriculum with best practice teaching and learning through student led

Students with their browse delivery at the Zoo's Orang-utan Sanctuary.



investigations, challenging deeper levels of thinking and connecting learning to the community.

Another element that became apparent through the pilot period was engaging the Victorian education departments. Government and Catholic school departments have been seeking authentic learning opportunities for their schools and have proved to be great supporters of our partnership project. The Catholic Education Office in Melbourne has provided various grants to their catholic partner schools to support plantation set up, funding zoo visits and teacher professional development.

### **Zoo and school partnerships are rewarding for all!**

By ensuring ongoing engagement, communities are empowered in their belief and ability to make a difference. If well supported these partnerships can offer rich, authentic experiences that have a genuine impact on deeper learning and changes in beliefs and attitudes, which could be a lever for effective community action beyond the classroom. A zoo school partnership can achieve that ongoing engagement and provide the support to mobilise the community to join us in creating a future where humans live in balance with nature. ◊

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For more information please see [www.zoo.org.au/Learning](http://www.zoo.org.au/Learning)

# The Center for Animal Research (CIA) and the art of creating meaning



by **María Martínez** HEAD OF EDUCATION | GUADALAJARA ZOO | MEXICO

IZE

**Guadalajara Zoo has over the past 19 years developed numerous new attractions for local and foreign visitors in the State of Jalisco in Mexico. Animal exhibits have increased by 50% since the Zoo was opened in 1988. The Education Department has developed new educational concepts such as Huentitán Naturaleza de Noche (Nocturnal House), the Safari Masai Mara, the Herpetarium, a recently opened Children's Vet Clinic, and one of the most important education buildings on site: the Central de Investigación Animal (CIA) – a renewed interactive learning center.**

I wish to share with you the process of rebuilding the interactive learning center: the transformation of “La Guarida” into the new Center for Animal Research – in Spanish “Central de Investigación Animal” (CIA) – an interactive learning center for schools and families to play and learn about animal behavior.

## **La Guarida: learning through play**

“La Guarida” (The Den) was opened in 1998 and was built with the aim of offering a high quality educational alternative for our visitors, that could be a tool for local teachers and parents in discussing three main themes: ecosystems, animal characteristics and animal adaptations.

This interactive learning center provided a unique opportunity to develop the capacity of children and adults to learn through play – one of the elements on which the interactive concept is based.

Healthy childhood development depends on emphasizing the activities that children carry out in relation to play. Thus, it is important that the methods applied in the games offered at the interactive learning center bear upon the following aspects of their lives:



**SOCIAL ASPECTS:** because it involves the coordination of activities with one or more partners, most of the game forms work in a natural way between boys and girls of similar ages. It may also strengthen the relationship between children and adults if they participate together in a play activity.

**CREATIVE ASPECTS:** as children have the freedom to try new ideas during play, it stimulates the imagination, which is the basis for creative development.

**PHYSICAL ASPECTS:** it provides total body exercise and helps develop coordination.



It helps with **INTELLECTUAL DEVELOPMENT** in a problem-solving environment because players learn to analyze data and make decisions in an informal way.

The game provides a feeling of **SECURITY AND SELF-ESTEEM** because it makes children the owners of the environment in which they are playing.

The rules of the game prepare the individual to **ACCEPT LIMITS**, also in a wider social dimension.

“La Guarida” received more than 1.5 million visitors. Visitors relate their experiences and in turn stimulate family members, friends, partners, even teachers to visit – so there is a mix of sexes, ages, experiences and knowledge.

### Developing the CIA

The CIA is the result of eight years of testing, failing, redesigning and testing again to find the very best way to:

- communicate educational themes and concepts (content)
- offer a contemporary surrounding
- design successful interactive exhibits for children of different ages and skills
- provoke reflection
- spark feelings
- create pleasant sensory experiences, enticing visitors to come back for more

CIA's development team goals were to:

- renew the formative (culture and education) offerings for schools and families
- continue the educational aim of the Department
- update and innovate the infrastructure and contemporary “science view” of exhibits
- design a creative approach to different publics
- communicate scientific educational content
- offer an attractive way to interact with animal subjects linked to peoples’ everyday life
- provoke reflection about the world we share with others (animals and people)

The main idea was to show “bits and pieces” of a whole day in an animal's as well as in a person's life. We wanted to present several behavioral analogies between animals and humans aimed at a unique conclusion: “We have the same problems” – the morning and the awakening, the afternoon and the development followed by the night and the resting or death.

### CIA's mission

The mission of the Centre is to redefine the role of zoos as interactive museums in the 21<sup>st</sup> century; engaging people in a dialogue, to create meanings from the past, present and future concerning wildlife, environment and human behaviors.

Human invention, innovation and creativity have reached breakneck speed. Such is the avalanche of change in the fields that CIA represents – science, technology, environment, the arts and media. The mission is an imperative for everyone – zoo staff and visitors – to try to make sense of the rapid and often confusing developments. The underlying idea: today's world is becoming increasingly complex. The future reaches us quicker than ever before and one has to seek knowledge for oneself. Otherwise, those with vested interests will shape your development and your future for you.



However, CIA wants to give people more than just facts. CIA wants to stimulate questioning, to provoke a personal response. Moreover, it aims to:

- **ENGAGE PEOPLE:** to reach everyone at every level regardless whether you are African or Mexican, young or old, broke or bountiful, KNOWLEDGE IS ESSENTIAL.
- **CREATE DIALOGUE:** there isn't a set of policies which we want to glue into your mind forever; we want to move back the furniture and create the space that is essential for dialogue between all kinds of people. We want to help provide everyone with a toolkit for developing their own opinions. The CIA's answer is clear: "Make up your own mind".

### The art of creating meaning

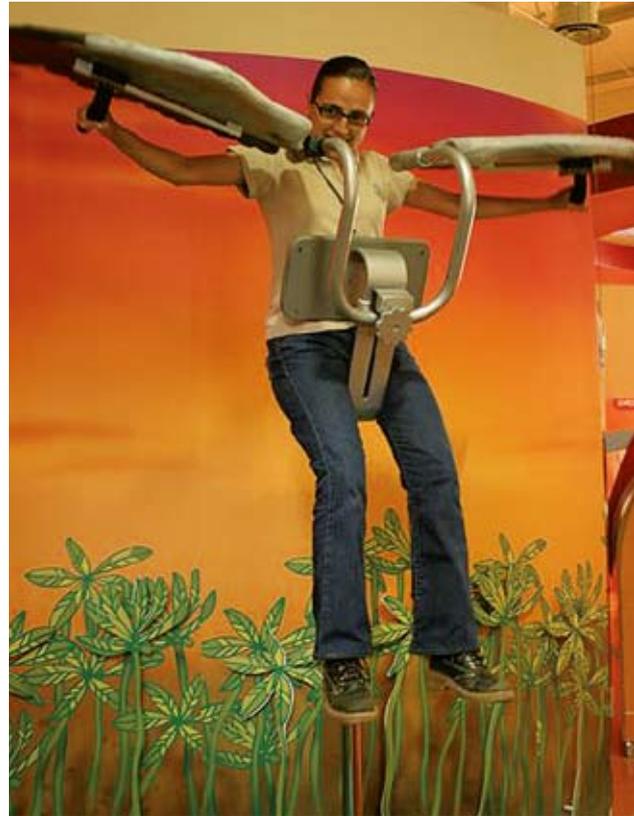
Physically, the center is divided into 3 main sections: the morning, the afternoon and the night. Every visitor that enters the CIA is an animal researcher, called AGENT Z-008. He or she gets his or her agent ID and will be able to use it in several terminals identified by the sign PODER IP (In Spanish: Investigador Picudo (IP) meaning Cool Researcher's Power). In every section there are exhibits with different interactive possibilities:

- some have software games
- some have mechanical devices
- some have graphic images to be observed and spot things or details
- some are "team challenges"
- some are workshops conducted by guides
- others are "life scenes" acted by guides

Behind every object there is an idea, and surroundings are endless human stories. Within one object a million stories breathe forever. These are the kind of connections we want to make in people's minds:

- **BECOMING SUSTAINABLE:** we have to make sure that our development today does not harm our children's tomorrows. This has become the most important challenge which humanity has to solve.
- **HUMAN INGENUITY:** our ability to invent, innovate and create has moved us from day one to seek a better way of doing things. Ours is a constant exploration of the way we continually try to understand and change the world. Why do we do it? To make sense of the planet, to change our lives, to gain understanding, to create new possibilities for our species...

To find the answers one first has to ask the right questions.



In this way, we will arrive at our final challenge: we must fascinate people with our stories and move them with our innovation and creativity.

— We want to know what you think? We want to know your story!

— Thus, the CIA is not here to tell you what to think, it is here to enable you to think

And then act ... if you want.



The CIA was opened to the public in January 2008. We hope to cater to 1000 visitors daily and proudly invite you to take part in Guadalajara Zoo's latest adventure. ◊

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437

# Measuring Emotion at the Zoo



by **Liam Smith** (PHD SCHOLAR), **Betty Weiler** (PROFESSOR AND DIRECTOR) and **Sam Ham** (PROFESSOR)

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**Emotions – happiness, surprise, anger, fear, wonder – play an important role in human experience.**

**The feeling of emotions can lead to changes in the way people think and feel and are also important in forming memories (Petty and Cacioppo 1986; Cahill and McGaugh 1995; McGaugh 2006).**

**Many zoo educators intuitively know this and, as a result, often design experiences that evoke a range of emotional responses, with the hope of delivering memorable experiences that cause visitors to think and feel differently about wildlife. However, zoo researchers have yet to produce findings that can inform zoos on how to elicit and then harness emotional arousal to achieve their often-stated aims of influencing visitors' memories, thoughts and attitudes.**

One reason for the lack of research success in this area is the difficulty in measuring and reconciling the many physiological and psychological responses that are associated with the experience of emotion. Findings from research in other contexts suggest that it is necessary to use multiple measures of emotion, including self-reports by the research subjects themselves. This paper outlines a multi-method approach to measuring emotions in a zoo context as well as presents some preliminary findings of the emotional responses of visitors at three zoos in and around Melbourne, Australia.

## **Self-report measures of emotion**

An obvious way of measuring emotion is to ask people how they feel or felt at a previous point in time, but this is not as straightforward as it sounds. According to Russell (1978) and many others, emotions are multi-dimensional, including the dimensions of pleasure (from pleasant to unpleasant), arousal (from sleepy to frenetic excitement) and dominance (from no to complete control over the emotion). As an example,

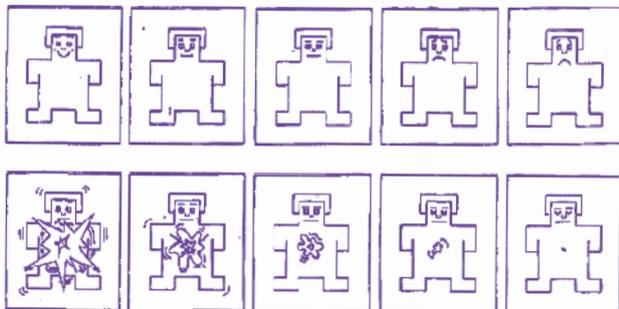
anger would be an unpleasant emotion associated with high levels of arousal over which an individual has some degree of control. Conversely fear is also associated with unpleasantness and high arousal, but differs in that the individual has little control over its occurrence. Some zoo experiences may be designed to make visitors feel joy, awe and wonder while others may seek to evoke anger, despair and frustration at the state of animals in the wild. Thus the pleasantness dimension of the emotion may be of less importance to zoos than the amount it is felt, making the emotional arousal dimension of greater interest. Indeed, it could be argued that the worst outcome for zoo educators is if visitors felt little or no emotional arousal during their trip to the zoo.

As a result, the most appropriate framework to adopt when obtaining zoo visitors' self-reports of their emotions one that includes a direct measure of arousal. Thus, the pleasure-arousal-dominance (PAD) model proposed by Russell and colleagues is particularly suitable. Their instrument, which uses six items to measure each of the three dimensions (18 items in

total), has been refined by Eroglu, Machleit and Davis (2003) to three items for each dimension, making it quicker to fill out.

The Self-Assessment Manikin (SAM) (Bradley and Lang 1994 – see Figure 1) requires more explanation but is even faster to fill in. Participants are told what each end of the robots means. For example, an explanation for the SAM on the pleasantness dimension might use the following wording: “Put a mark at this end where the figure is smiling if you are feeling happy, contented or pleasant and place a mark down the other end if you are feeling sad, melancholic or unpleasant. Feel free to place a mark on or between any of the figures.”

**Figure 1.** The pleasantness and arousal dimensions of the Self-Assessment Manikin (SAM) (Bradley and Lang, 1994).



These instructions are also given for the arousal and dominance dimension. When respondents are required to report on their emotions on more than one occasion, the SAM can be a really useful tool to use, since participants quickly learn the instructions and can report on current mood state with three simple X marks. This study used the pleasure and arousal dimensions of the three-item version of the PAD scale (6 items in total) together with the SAM for collecting self-report data on emotional states.

### Physiological measures of emotion

As was suggested above, emotions lead to many changes, both psychological and physiological. When we emote, our endocrine system releases a range of different hormones, our nervous system sends messages throughout the body, our face changes, we sweat, our pupils dilate, our heart rate changes and we prepare for action. These changes and many others – Cacioppo *et al.* (2000) document 37 different physiological measures of emotion – happen very quickly and can sometimes occur without any conscious awareness of them. So, although emotional arousal can be retrospectively sought through self-report measures, it is wise to complement these with physiological measures.

Liam checking the physiological equipment after a birds prey show.



Many researchers get frustrated by the fact that individual research subjects vary in how and where their emotions can be detected physiologically. For one person, being angry may result in dramatic changes to their heart, but not in their sweat. For another, the reverse may be true. Indeed, the manifestation of emotion not only changes from person to person, but also from event to event. Thus, the same person experiencing same emotion, but in a different situation, can yield different results.

Before outlining which physiological measures were used in this study, an explanation of how the nervous system works in relation to emotions is needed. At the broadest level, humans have two nervous systems, the somatic and the autonomic nervous system (ANS). The somatic nervous system is responsible for movement and conscious reception from external stimuli. The ANS on the other hand, is responsible for arousal and relaxation and has frequently been identified as the best place to look for physiological manifestation of emotions (Cacioppo *et al.* 2000). The two major divisions of the ANS are the sympathetic nervous system (SNS) and the parasympathetic nervous system (PNS). The SNS is responsible for arousal and results in heart rate increases, sweating, dilation of the pupils and rising blood pressure, among many other things. The PNS, on the other hand, is responsible for returning each of these changes back to normal. While many organs

receive messages from the SNS and PNS, the heart is one that can be measured relatively easily (Myrtek 2004).

A review of the literature on physiological measures of emotion reveals that there is a lack of non-cumbersome, real-time tools that can be used to measure arousal during real experiences. Certainly, physiological instruments with established validity can provide these real-time assessments and have been used for examining individuals' level of arousal. However, often these measurements have required bulky equipment and/or controlled settings and assessments have been confined to the laboratory. Recent technological innovations have led to a number of companies producing ambulatory monitors which can make assessments while subjects are in real settings, particularly in reference to psychophysiological measures of the heart.

Physiological measures in this study were taken using the Mindware MW1000A ambulatory impedance cardiac monitor and related software. The specific measures used to assess SNS were heart rate (HR) and the Pre-Ejection Period (PEP), and PNS was measured using Respiratory Sinus Arrhythmia (RSA).

Participant wearing the Mindware MW1000A ambulatory cardiac monitor.



The Mindware MW1000A ambulatory cardiac monitor.

Experience: walking through a butterfly house.



Photo © Rob Doolaard/IZP, Rotterdam Zoo

In summary, two self-report measures (PAD and SAM) and three physiological measures (HR, PEP and RSA) were used to measure emotional arousal during zoo experiences.

### Experiences tested

Eight zoo experiences were selected in consultation with zoo staff at three Australian zoos around Melbourne, and tested for the level of emotional arousal they elicited. These were:

#### Walking through a butterfly house

The Butterfly House at Melbourne Zoo contains numerous butterfly species which fly freely in a large glasshouse. The humidity and temperature of the Butterfly House are maintained at similar levels to tropical climates. Participants in this study walked through the Butterfly House and watched them and some participants had butterflies land on them.

#### Watching an orang-utan training session

A new orang-utan (*Pongo pygmaeus* spp.) exhibit was opened in October 2006. As part of the schedule of activities, keepers regularly conduct training sessions where a series of tasks are performed by the orang-utans at a close viewing point. Participants in this study watched one of these training sessions and were given some information about orang-utan husbandry during the session.

#### Attending a keeper presentation on elephants

This experience involved watching and listening to a scheduled public presentation at the Trail of the Elephants exhibit. Typically this involved training routines involving keepers and elephants that participants in this study watched through a glass viewing area.

### A birds of prey show

Participants sat in a 600-seat amphitheatre and watched one of the free-flight birds of prey shows. During this experience, birds flew over the audience, sometimes in close proximity while a keeper talked about the birds.

### A reptile presentation

This presentation was given by one of the keepers. During the presentation a number of different reptiles were brought out by the keepers and discussed. Participants in this study were invited to touch some of the different reptiles, including a carpet python.

### Watching an operation on wildlife at the Australian Wildlife Health Centre

Everyday activities conducted by vets in the Australian Wildlife Health Centre are on display. Participants in this study watched operations, animal assessments and rehabilitation. The veterinary staff would talk about what they were doing either directly to the public during a pause

in their work (e.g. while waiting for x-ray results) or during their work through a microphone.

### A behind the scenes lion-feeding tour

The Rip Roaring Feed tour allowed participants in this study to go behind the scenes and watch the male lions being fed. Typically participants were able to approach within less than a metre of the lions and were given an introduction to the facility.

### A bus tour around an open-range zoo

Werribee Open Range Zoo has a number of large exhibits and the only way to view these areas is on a 40-minute bus tour around the open-range section of the zoo. Visitors sit on a 72-seater bus and watch the animals while listening to a guide who drove the bus and provided commentary about the animals.

### Preliminary findings

While the focus of this paper is on the measurement of emotion, some preliminary results are presented here.

Experience: a birds of prey show.



Photo © Rob Dooland/12p

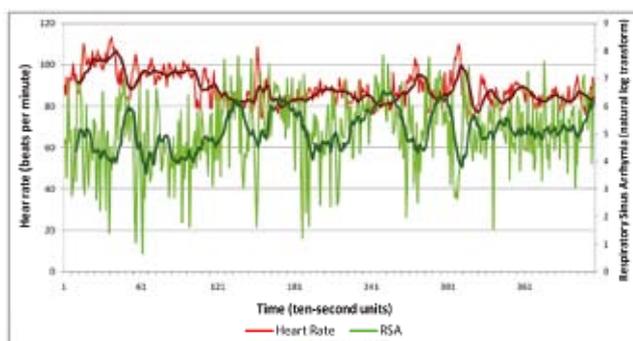
**Table 1.** Summary of SAM and PAD self-report arousal assessments.

Experience	SAM during-experience rank	SAM pre-during-experience rank	PAD during-experience rank	PAD pre-during-experience rank	TOTAL
Birds of prey show	1	1	2	1	5
Lion-feeding tour	1	2	1	3	7
Reptile show	3	5	3	5	16
Bus tour	5	4	7	2	18
Butterfly house	7	3	4	4	18
Elephant presentation	4	6	5	8	23
Orang-utan presentation	6	8	6	6	26
AWHC presentation	7	7	8	7	29

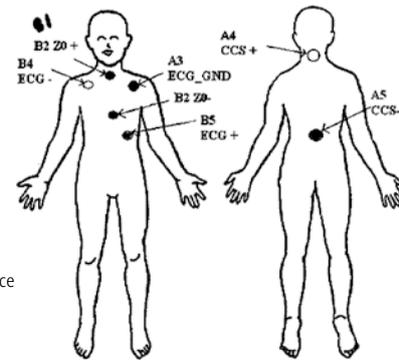
According to the results from the self-report measures (Table 1), the most emotionally arousing experiences were the lion-feeding tour and the birds of prey show.

Analysis of the heart data revealed that there was a lot of variation in HR, PEP and RSA during each of the experiences. Figure 1 gives an example of fluctuations in RSA and HR during one participant's visit to Melbourne Zoo. A key difference between self-report measures and physiological measures was that baseline measures were more difficult to obtain for the latter. Participants in the study were required to be in the movement mode of the experience itself (standing, sitting or walking) for at least one full minute prior to having the experience.

**Figure 1.** Graph of participant five's Heart Rate and Respiratory Sinus Arrhythmia at Melbourne Zoo including moving average trend line based on ten scores.



Also, participants needed to get used to wearing all the electrodes and be in the baseline position for several minutes before the baseline measurement was taken. Differences in HR, RSA and HR between the baseline and the experience were then calculated and ranked. Results showed that the same two experiences (the Birds of Prey show and the Rip Roaring Feed tour) were consistently identified as emotionally arousing on all three of the physiological measures.



Placement of electrodes for taking ECG and impedance measures of the heart.

### Where to from here?

All the experiences led to higher levels of emotional arousal. However, as was stated at the beginning of the paper, zoo researchers have not investigated the impact of emotional arousal on visitors' memories, knowledge, attitudes and behaviours. The next stage of this research project is looking at the impact of high levels of emotional arousal on these visitor outcomes. It seems that it is pretty easy to wow visitors when they come to the zoo. After all, the animals are often spectacular. What is more important is the meaning that comes out of experiencing high levels of arousal and whether zoos can use this emotional state to achieve their aims. ♦

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# Honouring Indigenous Cultural Perspectives for Sustainability Education

by **Dianne Gordon** LEARNING EXPERIENCES MANAGER | HEALESVILLE SANCTUARY | AUSTRALIA

**White Australia is only 200 years old. Before that time, Aboriginal people lived throughout Australia sustainably for around 60,000 years – the oldest continuous culture in the world. Much damage has been done to the Australian continent over the past 200 years. What can we learn from the original custodians of this land to assist us to live sustainably? Moreover, how can we appropriately communicate this to school students?**

Educators working in organisations such as zoos, wildlife parks and sanctuaries across Australia are holding in tension the requirements of interpreting the animals and the ecosystems of which they are a part (from a western, scientific position) together with the responsibility that we bear to interpret the indigenous perspectives of the land we now occupy.

From the early 1970s onwards there has been an increasing volume of research into how indigenous people managed the land and increasing consultation with Aboriginal people regarding land management issues:

‘There are now numerous policy and statutory documents at international, Federal and State levels which highlight the need for Indigenous people to be involved in environmental management. They seek to recognise the cultural, social and economic values that Aboriginal people ascribe to biodiversity and environmental health’ (English and Baker 2003).

## **Where do we begin?**

Murrundindi is the Ngurungaeta (leader, elder and custodian) of the Wurundjeri people in Victoria, Australia. He is a skilled teacher and provides the Sanctuary with cultural advice and first hand knowledge. Healesville Sanctuary, one of the Zoos Victoria properties, is on Wurundjeri land.

Murrundindi is always available for consultation and also runs a schools program called ‘Burra Burra Yan’ in the Sanctuary and in the adjoining Coranderrk bushland as well as one for adults. The program is

Murrundindi as an Aboriginal man.



highly sought after and reflects a real need for an indigenous teaching presence at the Sanctuary. It is through direct contact with students that the power of country, dreaming and knowledge transfer can be most fully conveyed. The oral history and information is infinitely precious and must be transferred in a relational context to honour the culture from which it comes in order to draw the students into examining how these perspectives would then lead them to live sustainably.

This is an example of deep learning; learning that results in the mind opening to explore possibilities then seeking out ways to be expressed in action. An evaluation of how these personal actions are inspired by respect is another area for further study.

## **Into practice**

At Healesville Sanctuary, students can participate in programs that explicitly address indigenous cultural

Murrundindi with boomerangs.



Murrundindi teaching how to use a boomerang.



IZE

perspectives. We have two programs addressing indigenous cultural perspectives: Dreaming the Indigenous Way and Respect for the Land: the Wurundjeri Way. Both programs are run by our educators and were produced in consultation with Murrundindi's mother, Jessie Hunter.

We have been given permission to pass on some children's level Dreaming stories to visiting students participating in Dreaming the Indigenous Way. These stories are part of the intellectual property of the Wurundjeri people and the rights to such knowledge are graded. 'Gender and age restrictions apply to knowledge. It is intimately detailed at the local level and belongs to the people of the country ...' (Rose 1996). Permission must always be sought to pass on knowledge.

Students are introduced to the Dreaming, have the option of having Dreaming symbols painted on their faces and participate in a creation story. They are also able to try and light a fire the traditional way. Respect for the Land is more suitable for older students and explores the culture, beliefs, social structure, history and land management practices of the Wurundjeri people. Out in the bushland, students learn about bush food plants, fibre and medicinal plants, technology and tools and from there are encouraged to work out what this will mean for them as they try to live more sustainably.

We need to ask *how* we can learn from Aboriginal people and open our hearts and minds in relation to indigenous cultural perspectives, to allow us to understand how we can share in the regeneration of the ecosystems alongside Aboriginal people. Fortunately now, there is some movement in a collaborative direction and this information needs to be conveyed to students.

We must engage with the following questions: How will imbuing indigenous cultural perspectives change what we teach? What do we believe about what we teach? How will we learn what to teach? How do we know what questions to ask and in fact what is appropriate to ask and what is not? Does there need to be a fundamental shift in the way we think?

Educators, on the whole, have received the benefits of studying in universities and teaching colleges. We are highly trained in western thought and we are experienced teachers, however, the opportunities for teacher professional learning in indigenous studies are scarce. Reading and research in spare moments, professional learning opportunities with Aboriginal people and ongoing discussions with colleagues are all available to educators – we are all able to participate in these to varying degrees over the course of our careers and we have a responsibility to pursue this as best we can.

A bird of prey.



## Helpful cultural perspectives: 'Country'

In 'Nourishing Terrains' written by anthropologist Deborah Bird Rose for the Australia Heritage Commission in 1996, several Aboriginal cultural perspectives are discussed that are very helpful in comparing their differences with those of western thought. It is the application and honouring of these Aboriginal cultural perspectives that assist us to see how we can live more sustainably with the earth and it is these that will help us to educate for sustainability.

Aboriginal people successfully used land management practices for 60,000 years. These arose from a world-view that had no place for consumerism. Land cultivation through the use of fire, seed placement, ensuring sufficient food was left for other animals and leaving parts of plants to regenerate for the following year was daily practice. Many Australian plants need fire to germinate their seeds, or to induce flowering. Aboriginal people used patch burning or 'mosaic burning' of different areas over many years to ensure that food plants would grow at different times of the year and for other areas, the fresh new growth would attract kangaroos to graze and thereby provide hunting opportunities. The fire was low intensity and carefully managed in relation to the time of year, the wind and the temperature. Women dug for tubers with their digging sticks, cultivating the soil, opening it up to the rain.

A marsupial.



Arbor day planting.



White settlers could not see the cultivation that was in harmony with the land. The seasonal and daily rhythm of Aboriginal land cultivation was torn apart as the white settlers introduced fences; cattle with their hard, ground-compacting hooves, green European grasses and the sheep to feed on it.

Aboriginal people successfully managed the land, because they respected the relationships among and between living things and the seasons. They also understand human society as part of the living ecosystem without it being the most important part. They see humans as being just as interconnected within the system as for example, the bandicoots sheltering in the bases of the native grasses.

Aboriginal people use the phrase 'caring for country' to describe their relationship to the land. Rose (1996) writes '...the word 'country' (is used) not only as a common noun, but also a proper noun. People talk about country in the same way that they would talk about a person: they speak to country, sing to country, visit country, worry about country, feel sorry for country and long for country. People say that country knows, hears, smells, takes notice, takes care, is sorry or happy. Country is a living entity with a yesterday, today and tomorrow, with a consciousness and a will toward life.'

There are hundreds of whole countries in Aboriginal Australia, in spite of the white demarcation of states. The communities in each country knew the networks for trade with other countries, the seasonal animals and their homes, the climate and the ceremonies of their own country. The knowledge in each community was and is local.

Melbourne Museum has researched the descriptions of the seasons for the country of the Kulin people, in Victoria near Melbourne. Each of these seasons also carries information about the plants, animals, weather and constellations. For example, the Buath Gurru Grass Flowering Season is in November, when bats are catching

insects, the Victorian Christmas Bush is flowering, there is an increase of Common Brown butterflies and the Orion constellation is seen setting in the western sky.

The seasons are marked in the following pattern:

**Iuk Eel Season** [March]

**Waring Wombat Season** [April-July]

**Guling Orchid Season** [August]

**Poorneet Tadpole Season** [September-October]

**Buath Gurru Grass Flowering Season** [November]

**Kangaroo-apple Season** [December]

**Biderap Dry Season** [January-February]

For students to absorb this information, we are asking them to pay attention in a way they may not have done before. This intensely personal and yet communal relationship to country opens students' eyes to a life changing worldview and this is something we need to evaluate specific to our indigenous programs.

### 'Dreaming'

The Dreaming is fundamental to Aboriginal people. It is the time of creation and yet it transcends time and continues into the present and the future. Different groups of Aboriginal people prefer different names for the Dreaming – Story, History or Dreamtime being a few. The Dreamings are the ancestors of all the animals, plants, humans, the elements and the Law. Each person has an individual 'dreaming' species for which they are responsible. This dreaming is embodied and the person's well-being is dependent on the well-being of their dreaming species. Here is

a deep alliance and responsibility that students find extraordinary and inspirational.

By accessing professional learning and then exploring cultural perspectives in consultation with the custodians of the land is an inspiring way to begin learning with students how best to live sustainably.

There is so much to be learnt! ♦

#### ACKNOWLEDGEMENTS

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For more information see:

<http://museumvictoria.com.au/forest/climate/kulin.html> for full descriptions of the interactions between the animals, plants, weather and constellations of the different seasons, together with some descriptions of the seasons by Aboriginal people.

[http://www.zoo.org.au/Learning/Programs/VCE/Healesville/Wurundjeri\\_Way](http://www.zoo.org.au/Learning/Programs/VCE/Healesville/Wurundjeri_Way)

Teachers Notes and Student Trail for Respect for the Land: the Wurundjeri Way.

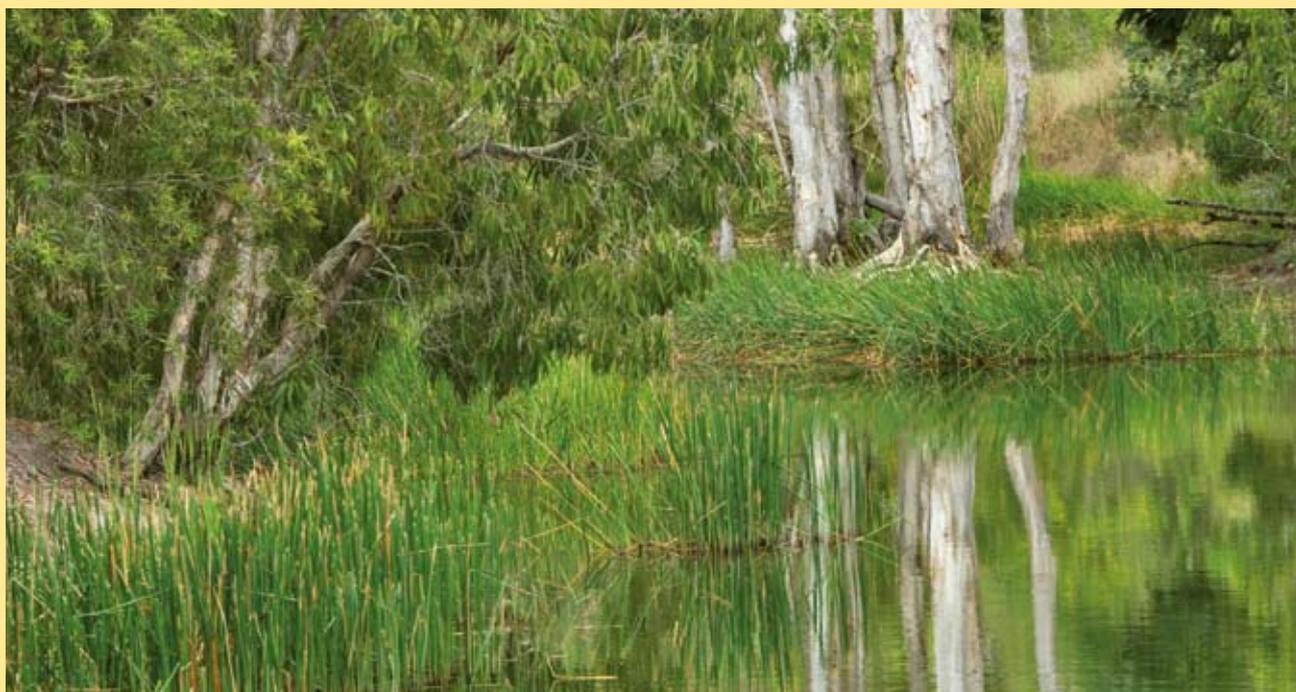
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A wetland environment.



# Catalyst for Structural Change in Small and Mid-Size City Zoos

## Summary and Feedback on the Second ACT Workshop in Kunming, China

by **Yang Mei** VICE DIRECTOR | KUNMING ZOO | CHINA, **Zheng Qingyoung** ZOO ENGINEER AND CONSERVATION EDUCATOR | CHANGCHUN ZOO | CHINA and **Laurel Askue** MANAGER OF CONSERVATION EDUCATION PROGRAMS | ZOO ATLANTA | USA

**As defined by the Association of Zoos & Aquariums (AZA), conservation education in zoos is a powerful tool for connecting people with nature. With 143 million annual visitors, AZA-accredited facilities have the potential to significantly raise conservation awareness through effective education programs. But, can these facilities extend their reach beyond borders? Discover how the Academy for Conservation Training (ACT) is bringing education best practices utilized in the U.S. to zoos in China.**

ACT Graduate Lu Yan Providing Instruction, Changchun Zoo Field Trip Pilot.



Along with the swift development of society, the two hundred year-old zoological industry is also experiencing a period of unprecedented change. During the 1980s, education programming in AZA-accredited zoos in the U.S. expanded beyond school groups to look at the overall visitor experience. With this change in audience, teaching shifted to an informal education style that was more suited towards the zoo setting. At that time, zoo education was designed to increase factual information about animals and ecosystems in the hope that increased knowledge would make people better environmental stewards. This changed in the 1990s when scientific evaluations determined that knowledge does not necessarily lead to long-term behavior change. These studies demonstrated that people could be knowledgeable about an issue and yet not take action. Also, people could be inspired to take action without a lot of background knowledge. As a result of these findings, AZA-accredited zoos and aquariums determined that even though facts are intellectually interesting they are typically not enough to make an “emotional connection”. In order for people to be inspired to change their behaviors, they have to experience something on an emotional level (Ham 1992). In response, many modern zoos and aquariums are now focusing their education efforts on identifying the most effective ways to inspire and measure conservation behavior change (Falk *et al.* 2007).

According to the latest statistics, 218 Chinese zoos and animal exhibition areas are accredited by the Chinese Association of Zoological Gardens (CAZG). Many of these are large professional zoos located in capital cities, some of which have moved forward with the trend of other modern zoos. However, the majority of small and mid-sized zoos in China are still in a relatively backward situation. Of these less developed zoos, animals are exhibited in cages that visitors passively observe; popularization of science is primarily propaganda; there is a lack of long-term investment in capital infrastructure; most funds come from government subsidies and admission is the primary source of income.

In addition, the majority of Chinese zoos do not currently have education programs or departments, much less a paid educator on staff. In response, CAZG initiated a partnership with Zoo Atlanta (an AZA-accredited zoo in the U.S.) to actively promote the establishment of conservation education within the Chinese zoo industry. To reach this aim, CAZG and Zoo Atlanta developed the Academy for Conservation



Training (ACT) to bring conservation education best practices utilized by zoos in the U.S. to zoos in China. Designed specifically for Chinese zoo professionals and funded by The UPS Foundation, the 10-day ACT workshop utilizes multiple teaching methods to convey the history and development of conservation education in the U.S. and its relevance to the missions of modern zoos; combined with proven techniques to establish self-sustaining education programs.

Since its inception in June 2006, ACT has conducted training workshops in Chengdu, Kunming, Beijing and Guangzhou to graduate a total of 161 individuals who represent 42 zoos and wildlife parks throughout China. This article will include reflections from two ACT graduates currently working at mid-size zoos in China to demonstrate how this program is shaping the changing role of conservation education in small and mid-size Chinese zoos and some of the barriers that must be overcome along the way.

### **The situation**

During the 1990s, several wildlife parks were developed in the outskirts of China's urban areas. These facilities were characterized by having large open environments that allowed people to have direct or indirect contact with free-ranging animals. The wildlife parks not only diverted visitors from urban zoos, but also confused the concept that zoos serve as public welfare institutions. This awkward situation made it very difficult for small and mid-size city zoos to carry out their responsibility to society, much less survive, and forced them to think about how to better manage their business while also keeping up with the pace of development. With the help of ACT, small and mid-size city zoos are beginning realize that one way to lead themselves out of their current difficult situation and strengthen their role in serving the public is to reorient their focus towards conservation education. To do this effectively,

Changchun Zoo Field Trip Pilot (Lu Yan pictured far right).



these zoos need to examine themselves, be aware of competition, be willing to accept criticism, and perhaps most importantly, learn how to motivate people to change their behaviors in order to live more harmoniously with the natural world.

In an effort to develop, many of China's small and mid-size city zoos are now paying closer attention to their audiences. As a result of the country's economic and social progress, the majority of their visitors are now higher educated and more conscious about the welfare of animals and the environment. In turn, they are no longer satisfied with just passively looking at animals housed in inadequate conditions. They also have an increased interest in other aspects of the zoo experience, such as exhibition environments, landscaping, entertainment infrastructure, pictorial and written information, public order and the quality of service. Understanding audiences is one of the key concepts in the ACT workshops, but it is still a relatively new idea to zoos in China. For example, during the

Kunming training, the ACT instructors pointed out that a large majority of Kunming Zoo visitors were seniors. Since they receive free admission to all parks and gardens in China, of which zoos are included, the instructors suggested developing a volunteer program targeted towards this audience. Upon hearing this suggestion, Kunming Zoo personnel welcomed the opportunity to create a senior volunteer program that would provide assistance to keepers and administrative personnel, while also increasing community interest and support towards their Zoo.

### Awareness

Unfortunately, zoos in China must realize and accept that integrating conservation education into the Chinese zoo industry will be a long process, not a quick fix. Raising awareness, on all levels, is the first step to integrate conservation education into the daily work of Chinese zoos. Understanding the role conservation education can play in supporting a zoo's conservation mission cannot be stressed enough. To keep up with the pace of other modern zoos, zoo directors and even the directors' superiors should be well-informed of the importance of conservation education and current trends in zoo education.

To do this under the current Chinese zoo administration, it is necessary to adjust departmental set up, fully utilize human resources, increase educational function, and enhance the research and understanding of visitors. It is also necessary to view conservation education as part of the zoo's fiscal plan and central to the entire zoo operation in order to make everyone understand that the key to success depends on the participation of all zoo personnel. This way, departments

Changchun Zoo Conservation Education Task Force (Zheng Qingyoung pictured second from right).





will no longer continue to be separated or uncoordinated. While practicing conservation education, zoo keepers become spokespersons for animal husbandry and wildlife conservation, gardeners become designers as well as builders in naturalizing animal exhibit areas, and management becomes leaders in market research and policy making in order to evaluate and enhance effectiveness of conservation education projects.

### First steps

As the economy continues to rapidly expand and people rush to move into urban centers, many cities in China have plans to relocate or renovate their zoos. But, China has few commercial companies dedicated to designing modern zoo exhibits, so it is likely that traditional zoo exhibit designs will be utilized merely out of a lack of knowledge about alternatives. As in the case of Kunming Zoo, these traditional exhibits include animal cages in the style of “concrete + chain link fence”. To catch up with modern zoos, the architectural design of Chinese zoo exhibits should provide conservation information, be up to animal welfare standards and include enrichment elements. To continue building old-fashioned exhibits in a developed world would constitute a deep regret. Again, the problem of awareness arises.

In addition to a need for exhibit renovation, many small and mid-size city zoos in China need to update their zoo infrastructure and husbandry practices. Performing this work coupled with establishing conservation education departments and programs can appear daunting. Rather than letting these limiting factors prevent them from attempting to begin integrating education into their daily work, ACT encourages these struggling zoos to utilize their existing resources to begin the process, even if there is no financial investment in education or if it is impossible to make big changes initially.

For the welfare of the planet, the most important outcome of conservation education in zoos is to have visitors participate in education programming that result in positive long-term behavior change. Therefore, even without policy guidelines or infrastructure and exhibit improvements, small and mid-size zoos can use what is taught in the ACT program to begin to develop effective conservation messages and educational programming that meets the needs of their audiences. By doing this, zoos would begin to once again serve their local communities without too much investment.

### Conclusion

The introduction of conservation education in Chinese zoos can be the catalyst of change for the entire zoological industry, especially for the small and mid-size zoos, to change their current function and to rescue themselves from a difficult situation. However, education is a gradual process, so it is not realistic to demand that conservation education change a zoo’s current situation in a short period of time. But, over the course of time, if zoos throughout China make conservation education a priority, then this will create a basic foundation to build from and structural change in small and mid-size city zoos will be possible. ♦

Kunming Training Graduates.



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# Who Needs a Species Label?

by **Ardaan Gerritsen** PRESENTATION SPECIALIST AND EDITOR  
BLIIDORP MAGAZINE | ROTTERDAM ZOO | THE NETHERLANDS

**The educational goals of Rotterdam Zoo are to raise respect, even admiration, for the animal-as-it-is. This can in part be achieved by presenting interesting facts which stimulate wonder – the main aim for our species labels. Thus, our visitors are not given a standard list of biological facts (e.g. size, diet, Red List data, weight, distribution), but only the amazing and interesting traits of an animal. We never tell the obvious. But how effective are our species labels really? Evaluation would provide some important answers.**



In 1990 two students joined the Education Department of Rotterdam Zoo to research species labels. They evaluated the effectiveness of the western lowland gorilla (*Gorilla gorilla gorilla*) species label and discovered that it was read by a mere 5% of the visitors. Independent of content or the amount of text on the label, on average only 30% of the information was actually read by visitors.

## Colours

Sixteen years later one of the former students, now Head of Education at Rotterdam Zoo – Robert van Herk – decided it would be useful to do a similar investigation amongst today's zoo public centred on the question: Do visitors read species labels and how effective are they in achieving Zoo goals?

Research was carried out by a student whom unfortunately suffered many setbacks which frustrated the evaluation process, i.e.:

- the removal of the species from the enclosure during the investigations
- logistic changes in visitors' movements

- bad weather conditions
- wrong time of the year (too few or too many visitors)
- highly visible investigators
- the unexpected appearance of new signs/panels/guided groups/display
- other attractive signs/panels/displays nearby

These were pitfalls to be avoided in any further research! However, she did discover that a key factor in making species labels more attractive was the right use of colours! Colourful species labels attracted more attention than labels in a single colour.

## Text vs. cartoons

A new research took place in the winter of 2007. Two students made two species labels for the greater roadrunner (*Geococcyx californianus*); one with mainly text (plus a species photo and a distribution map), the other with mainly cartoons (and a photo and very short texts). These labels were of a similar, colourful design. The contents of both labels were identical. The roadrunner does not have a very interesting appearance; not interesting enough to attract the full



attention of the visitor. However, the bird has some quite interesting qualities which can easily be interpreted and illustrated. One automatically passes its enclosure on visiting the Oceanium (a main attraction of the Zoo). The enclosure design arouses curiosity to discover what animal it houses. There is enough space for the researchers to see what visitors do and to take them aside to ask some questions. These favourable circumstances determined the choice of species label to be evaluated.

First, the 'cartoon label' was placed next to the roadrunner's viewing window (note that there was no other label in sight). The researchers counted and observed the visitors. The first 50 visitors who looked at the label were interviewed. Next, the cartoon label was changed to the 'text label' and the process was repeated. The results were disappointing! 3797 visitors passed by, many looked at the roadrunner but only 50 read the text label (1.3%). Slightly less disappointing: 2381 visitors passed, many looked at the roadrunner and 50 of them looked at the cartoon label (2.1%). Conclusion: the vast majority of visitors do not read the labels.

Perhaps the roadrunner and its enclosure were so interesting that they distract from the label? Our guess was that the label was not in the right place!

One of the questions the students asked – "Which would you prefer: a text label, a cartoon label or a combination of the two?" – conveyed that 44% of the text label 'readers' preferred a text label, 8% an illustrated label and 44% a combination of the two (4% had no opinion). Whereas, 8% of the cartoon label 'watchers' preferred a text label, 20% an illustrated label and 70% a combination (2% had no opinion).

Interestingly, 88% of the 'readers' were older than 30 years as to 50% of the 'watchers'. Thus, the watchers group was considerably younger: 30% was even younger than 16 years. The male/female ratio was more or less even. The level of education between 'watchers' and 'readers' differed: 54% of the watchers had a higher professional or university education as to 80% of the readers.

Another important question was: "Could you tell me something about the roadrunner?". People could

mention eight different items that were explained on both species labels. There were striking differences between answers from watchers and readers (see table 1).

**Table 1.** Reproducing roadrunner facts.

Label/visitor type	Cartoon/watcher	Text/reader
Weight	30x	7x
Speed	34x	34x
Length	11x	7x
Breeding time	10x	3x
Environment	2x	11x
Food	3x	17x
Movie	7x	16x
Nesting place	2x	7x
<b>TOTAL</b>	<b>99 answers</b>	<b>102 answers</b>

Unfortunately, we do not know what knowledge our respondents had before they visited the roadrunner so we cannot tell what they actually learned from our species labels. However, many respondents spontaneously said “I didn’t know that a roadrunner... (is so fast / eats scorpions / breeds in a cactus / etc.)”. Nevertheless, let us assume that any given answer enlarges the admiration of the respondent for the species.

We already concluded that visitors prefer colourful labels with texts and cartoons. We could now also conclude that some messages are more suitable for text and some are better for cartoons, and some are fit for both. Thus, if we want to direct messages to children and young adults, we might use more cartoons. If we want to direct messages to older adults then text labels would be preferable.

### Label location

It was clear that many respondents preferred cartoon labels. A follow-up research was carried out. A group of five students researched whether photos or drawings should be used instead of cartoons, and which of the two was more effective. To be able to compare the results to that of the previous research, the students commenced with the roadrunner. But they did not have much time to observe and ask questions. The result was that they only got two completed questionnaires after a four-hour wait! Then they started experimenting. In doing so, they made their investigation worthless but at the same time they found out how important the location of a species label was.

The roadrunner label was attached to the wall next to the enclosure. Visitors leaving the enclosure could see it. It was situated at mid-body level. Above the roadrunner label, there was a label of the burrowing owl (*Athena cunicularia*) attached at eye level which



attracted all the attention! Only two persons in a wheel chair and a mother with small children spotted the roadrunner label!! Perhaps they considered the live owl more attractive than the live roadrunner?

Unfortunately, the exact number of visitors viewing the enclosure was not recorded though probably averaged 450 persons.

Before reaching the enclosure, visitors would pass by an interactive where one is invited to turn a switch to remove a big ‘?’ for an answer. Approximately 90% (a guess, as it was not recorded properly) of the visitors played this game. The by now frustrated students removed the roadrunner label and placed it exactly in the middle of the window pane, right in front of the enclosure. No visitor could miss it and about 40% of visitors looked at it for at least more than a second.

### Position and lighting

In the mean time – elsewhere in the Oceanium – one of my colleagues carried out her own study. Amongst other things she discovered that at a certain aquarium 11% of passing visitors checked the species label; this was 18% of visitors who actually looked at



IZE

the aquarium (compare this to the 1.3% mentioned at the beginning of this article)!

This 'super-attractive species label' was attached just above and adjacent to the aquarium window and was illuminated by a spotlight. The aquarium itself is very attractive and contains several colourful fishes. I assume that visitors were curious to know the inhabitants' names.

At another aquarium 8.7% of passing visitors checked the label – which was 27.1% of the visitors who actually looked at the aquarium (note that not every passing visitor looked at the aquarium).

The five frustrated students (their investigations not being scientifically sound, with terms like 'many' used instead of numbers) decided to continue their investigations at the Komodo dragon (*Varanus komodoensis*) exhibit. The species label was located above the enclosure's window and was illuminated by a spotlight. Other labels and panels nearby were covered by the students. Within a few days they had sufficient data to conclude their study: many people looked at the species label, many even read most of it. The students

observed children standing in front of the label for several minutes, heads lifted to read all the information on the Komodo dragon!

In conclusion, my advise is to:

- Don't expect too much attention from the public for your species labels
- Direct your efforts to attractive animals and enclosures; don't spend much energy on inconspicuous animals
- Make labels colourful and mix texts with cartoons and drawings
- Think well about where you attach your species label; place it within sight of the visitor who stands in front of the enclosure, and place it at eye-level or higher
- Make sure that no other nice displays such as interactive panels are near to your species label to distract from it
- Put a spotlight on your label. ♦

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# Indigenous Environmental Knowledge

## As a Tool in Conservation Education Training in Papua New Guinea

by **Sangion Tiu** CONSERVATION EDUCATION PROGRAM MANAGER | RESEARCH & CONSERVATION FOUNDATION | PAPUA NEW GUINEA and **Dr. Chris Eames** SENIOR LECTURER | CENTRE FOR SCIENCE & TECHNICAL EDUCATION RESEARCH | UNIVERSITY OF WAIKATO | NEW ZEALAND

**Recent research by Tiu (2007) has highlighted the importance of local environmental knowledge and practices in conservation education in Papua New Guinea. This finding has led to changes in the delivery approach for Conservation Area Teacher Training Workshops. The improved approach incorporates activities that enable participants to explore past and present indigenous environmental knowledge (IEK) and practices that can contribute to promoting biodiversity conservation efforts as well as enhancing conservation education in Papua New Guinea.**

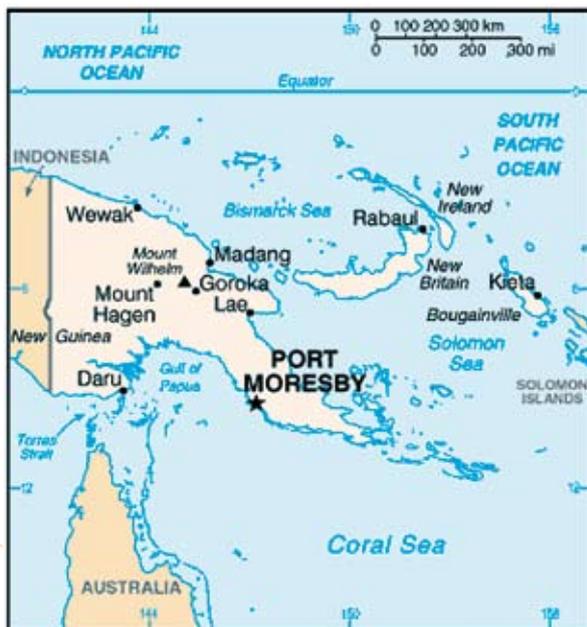
Conservation Area Teacher Training Workshops conducted by the Research and Conservation Foundation (RCF) of Papua New Guinea (PNG) target teachers in conservation areas (see Map 1.1). The workshops range from three to four days and use curriculum materials adapted from the Wildlife Conservation Society (WCS 1994, 1995a, 1995b), namely the

Habitat Ecology Learning Program (HELP) and Pablo Python Looks at Animals (Pablo) materials. The training materials have been designed to enhance teachers understanding of basic ecological concepts (HELP) and animal adaptations in terms of survival needs (Pablo). The RCF has recognized a need amongst primary and elementary school teachers in PNG for more ecological knowledge. The primary schools enroll children between the ages of nine to fourteen while elementary schools enroll those between six to eight years old. Teachers at these levels are generalists, thus the workshop content contributes to enhancing their knowledge in basic ecology. A normal workshop begins with introductory sessions followed by a discussion of topics and follow-up activities which are spread throughout the week. The activities are varied and range from art and craft to simple experiments and observations.

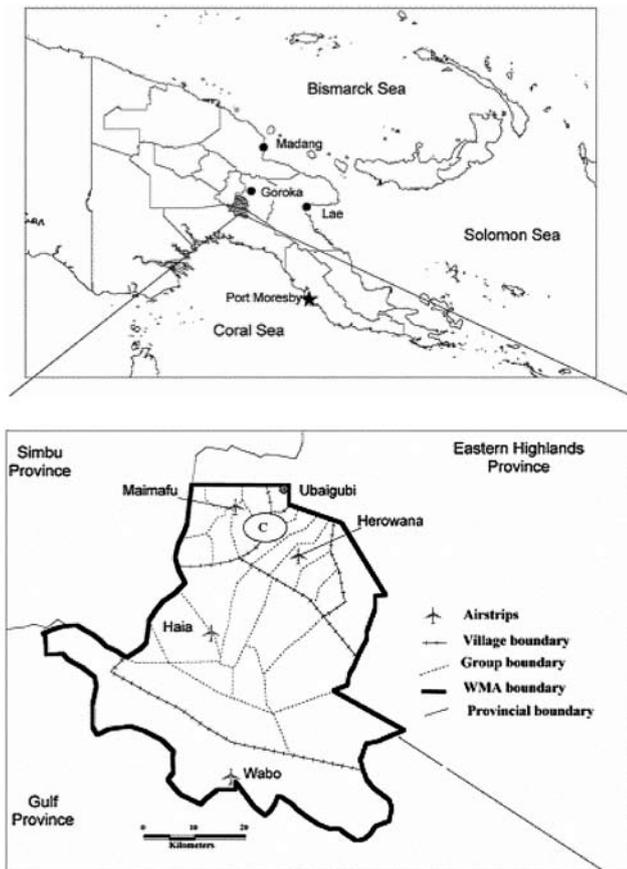
### Background

Conservation areas in PNG are situated on traditionally owned lands. People within these areas have access to their natural resources and will continue to do so for many more years. RCF, as a conservation organization working in these areas, is challenged to promote sustainable resource use and management among the local people, and therefore uses conservation education

**Map 1.1** Papua New Guinea (source: CIA Fact Book).



**Map 2.1** Crater Mountain Wildlife Management Area (source: Johnson, Bino & Igag).



**Table 1.1** Examples of Indigenous Environmental Knowledge.

Types of Indigenous Environmental Knowledge	
-	Indigenous family knowledge
-	Indigenous environmental practices of gardening, hunting and construction
-	Local forest knowledge about fauna and flora
-	Sustainable gardening and hunting practices based on indigenous beliefs

Local forest knowledge about fauna and flora, for example, is very useful to the indigenous people. With this knowledge, they are able to locate different resources on their land and would know if a resource is in plentiful supply or declining. In addition, spiritual beliefs and practices also play an important role in their livelihoods. This knowledge contributes to conservation by placing restrictions on where people can go and what they can or cannot harvest in certain places. For example, in one of the villages in the study (Tiu 2007), people reported that they did not go to a particular waterfall because they believe that it is guarded by spirits. As a result, the local people do not make their gardens or go hunting there, so the forest and its resources around the waterfall remain untouched. Such knowledge indicates that indigenous people have a complex understanding of their forests (Sillitoe 2000) and this knowledge is a factor in the conservation of their lands.

as a tool to empower these communities. RCF's experiences with the Crater Mountain Wildlife Management Area in the border of Eastern Highlands and Simbu Provinces of PNG (see Map 2.1) indicated a need to link conservation efforts and local resource use and management. Recent research by Tiu (2007) highlighted a part of this missing link: the recognition of local or indigenous environmental knowledge (IEK). IEK as defined by Tiu (2007:18) is "the accumulated knowledge and skills of indigenous people and their relationships with the environment". IEK is vital because it emphasizes local knowledge of fauna and flora and provides an avenue for linkage to biodiversity conservation efforts. An understanding of indigenous people's prior knowledge is essential to make biodiversity conservation more meaningful. People will not remember conservation messages if they are not relevant to their everyday life and concerns (Orsark 2005).

Tiu (2007) also concluded that villages in Conservation Areas possessed much IEK. Her study, which was carried out in two villages in conservation areas in the Eastern Highlands Province of Papua New Guinea (see Map 2.1), stressed that local people possess environmental knowledge that connects them to their environment and forms the basis of their beliefs and practices. Some examples of types of IEK are highlighted in Table 1.1.

Tiu's (2007) study suggested that an incorporation of indigenous environmental knowledge into conservation education courses should enable it to be used as a tool to promote biodiversity conservation efforts. The research recommended that an inclusion of indigenous environmental knowledge in conservation education will enable participants to recognize their local environmental knowledge and practices and why these need to be protected through conservation efforts.

Indigenous knowledge and practice of sago making.



## A changing approach

The recommendations by Tiu (2007) were implemented in the past year by RCF in its Conservation Area Teacher Training Workshops (CATTW). The changes in the CATTW included the participation of non teaching local elders who are given opportunities to share their knowledge of local fauna and flora.

Forest resources with medical value.



Activities are site based and include:

- identifying and comparing local habitat types to common habitats of the world to provide an insight into the diversity of the local habitat
- exploration of local fauna and flora with emphasis on endemic and endangered species provides an opportunity to identify what significant species are found in the local habitat
- interviews and talks by elders on the history and origin of the local people with an added emphasis on how early settlers viewed their environment and resources to make comparisons between past and present attitudes to local environment
- interviews with local elders to establish human impact on the environment and the consequences of these actions today
- exploration of local knowledge on fauna and flora, seasons and climate and how these influence people's lifestyles to emphasize importance of these on people's livelihoods
- field visits to specific local sites of interest with local elders and participants as guides. Information on uses of local plants and animals is also showcased by local teachers and elders to demonstrate IEK.

The above activities have been incorporated into the CATTW delivery approach because Tiu's (2007) study indicated the need to amalgamate familiar knowledge, approaches, skills and activities to enable the local people, and teachers in particular, to link the workshop

content to everyday activities in the village. This also addresses any misconceptions the local people may have about their local fauna and flora and at the same time introduce some scientific knowledge, skills and approaches. Moreover, the elders were found to be very knowledgeable about practices and issues related to their local environment (Tiu 2007). By using them as resource people, teachers and other participants can recognize the value of their local knowledge and how they can use this to protect their environment and its resources.

Changes in the delivery approaches also include an awareness session for the local community in the form of dramas/plays and talks to show what participants have acquired throughout the workshop. This provides opportunities for the whole village to observe and learn from the experiences. Awareness talks are given by RCF staff followed by a distribution of posters and other information on endemic and endangered species of PNG.

The use of local sites for field trips have also boosted local participants moral as they are able to showcase their knowledge of the local fauna and flora and its uses.

## Lessons learnt

The lessons learnt in delivering CATTW in this manner are quite rewarding. Participants are able to link their own local knowledge with the reasons for conservation. For example, some communities demonstrated strong links to early settlement sites and have taken measures to protect this. Through interviews, loss of species was also identified by some as due to negative human impact with suggestions made on how to improve them. Participants also identified seasonal changes as influencing food distribution.

Mangrove forest as a habitat.



This recognition is vital for RCF and other conservation organizations in PNG because it means the local people are able to identify the purpose and importance of biodiversity conservation efforts in their communities.

In conclusion, IEK is vital for conservation education as it enables people to recognize the value of their traditional local resources and participate in their management. It has been recognized in the Conservation Area Teacher Training Workshops that integrating indigenous environmental knowledge and practices with internationally-promoted conservation management can improve education for local school students. This approach can reinforce the value of IEK as traditional practices that are good for conservation and help to retain these practices as indigenous communities seek to modernize. 

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# Wild Carnivores: From Conflict to Tolerance



by **Lucía Soler** BIOLOGIST AND PROJECT LEADER | HUELLAS ASSOCIATION FOR THE STUDY AND CONSERVATION OF BIODIVERSITY | ARGENTINA

Since 2002, a notable education conservation project has been taking place in Northeastern Argentina. Affective campaigns, talks, dramatizations, puppet shows, stories and drawings proved very effective tools in gaining the confidence of children and youngsters and learning more about the predators' perception. The protagonists were the maned wolf and Geoffroy's cat: rare and charismatic species.

Wild carnivores are considered rare, beautiful, powerful and majestic animals. Around the world they are regarded as mega charismatic. However, conflicts between predators and man are on the rise. Frequently, the implementation of specific educational projects is required to get at the root of the problem and generate conservation actions. The project 'Carnivore Conservation' in the Northeast of Argentina's aim was to work together with local children to create a new image of wild carnivores; re-thinking them as predators, as necessary components of ecosystems, thereby promoting their value in the wilderness.

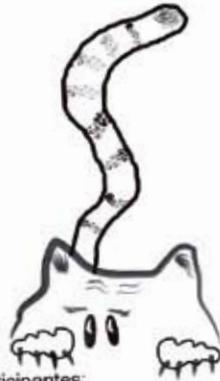
## Species in conflict

Until the last century, Northeastern Argentina was inhabited by six species of wild cats (60% of South American felids): jaguar (*Panthera onca*), puma (*Puma concolor*), ocelot (*Leopardus pardalis*), pampas cat (*Leopardus colocolo*), Geoffroy's cat (*Leopardus geoffroyi*), and jaguarundi (*Puma yagouarundi*). The puma was considered extinct since the 1950's but has recently been sighted by rural residents. Today, carnivores found in the region consist of one procyonid, three mustelids, three felids and three canids, including the maned wolf (*Chrysocyon brachyurus*). All the species are

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Foto de un gato de la zona de Mburucuyá. ASOCIACIÓN ARGENTINA DE EDUCADORES DE MURUCUYÁ

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killed for different reason: myths, legends and customs which determine local traditions and behaviors over long periods (Linares 2003). Interviews (n=600) with rural people show that the factors which promote human carnivore conflict have been poorly charted.

### Main activities

The project has worked together with rural schools to design activities to improve writing, reading and debating skills (Soler *et al.* 2006). Additionally, three kinds of educational strategies were implemented for conservation:

- 1 **Awareness campaign:** talks with dramatizations of the maned wolf and wild cats. Participants ranged from 4 to 17 years old. Also teachers took part in the activities.
- 2 **Printed resources:** guides on carnivores. Children between 6 to 13 years of age received the material. Teachers directed the activity.
- 3 **Workshops** on the conservation of the maned wolf and its habitat. Children between 3 and 13 years participated; the youngest ones with their parents. Puppet shows and drawings were the activities carried out in small groups. Children were amongst other things encouraged to paint maned wolf silhouettes.

### Writing versus drawing?

The talks and the puppet dramatizations proved a useful trigger in developing additional activities and helped us to create a warm and pleasant environment in which to work together for the same purpose. The children felt very comfortable with the dramatizations and the artistic activities which pursued.

The printed material, however, presented disadvantages due to the fact that we worked with bilingual communities (Spanish and Guaraní). Currently, we consider the texts as a tool of little value in uncovering the perception and knowledge of the children about the wild carnivores because of their poor command of the Spanish language. The difficulties in writing and interpreting texts must be taken into account when planning teaching strategies since it is not possible to build an environmental education program only on recreational activities. The implementation of drawing as an educational as well as evaluation method in conservation should be complemented with other educational strategies in order to gain a more comprehensive picture on the perception of children, and to determine their knowledge about the environment.



## Strengths and weaknesses

We have established the following *weaknesses* in trying and testing our program:

- 1 Bad writing or incorrect use of the Spanish language
- 2 Poor syntax and general inability to write complete sentences
- 3 Lack of creativity
- 4 Lack of concentration
- 5 Poor interpretation of texts, even the simplest ones

On the other hand, we recognize specific *strengths*:

- 1 The maned wolf is a charismatic and emblematic species
- 2 There is a definite interest in learning more about predators
- 3 In general, the project and the educational activities are well received

Kneading and shaping both the weaknesses and strengths, we evaluated and then developed new inclusive educational strategies, involving all the stakeholders of the community.

Conservation action relies on the development of public understanding of the relationships between wild species, the environment and peoples' own attitudes and behaviors (WAZA 2005). To this effect, the maned wolf was used as a tool to increase knowledge about biodiversity, and to promote a positive attitude and tolerance towards so-called conflictive species. ♦



## ACKNOWLEDGEMENTS

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## Joint WAZA - IZE CONFERENCE

Adelaide Convention Centre  
Sunday 19 - 23 October 2008

### Hosts:

**Chris West**  
CEO Zoos South Australia

**John Gardner**  
IZE Regional Representative

For more information visit  
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