



Journal of the
**International
Zoo Educators
Association**

Number 41

2005





Journal of the International Zoo Educators Association

IZE is an association dedicated to expanding the educational impact of zoos and aquariums worldwide. Its dual mission is to improve the education programmes in the facilities of its members and to provide access to the latest thinking, techniques and information in conservation education. IZE facilitates communication and professional development among zoo/aquarium educators and supports liaison with related organisations such as WAZA (The World Association of Zoos and Aquariums) and CBSG (Conservation Breeding Specialist Group).

www.izea.net

C O N T E N T S

- 01 Editorial
- 02 The more things change...
- 04 Rhinos might be ugly...
- 07 A bird book
- 08 Why a cartoon?
- 10 Playing in the zoo
- 12 Guadalajara Zoo y conservación
- 16 The conservation of evolution education
- 20 New interpretative displays
- 22 A vital role for zoo educators
- 26 Environmental enrichment in Lisbon
- 29 "Masola Rainforest"
- 31 Oarsome aquatic adventures
- inside back cover: Officers

Number 41
2005



front cover:
white rhino
Alan R Thomson

Editorial

More please

by Martin Serafini



Editor
Martin Serafini

It is with both pleasure and sadness that I write this editorial – it is my first, and will be my last. For personal reasons I am resigning and moving on from my current position at Edinburgh Zoo.

More importantly, I hope you will find that the Journal – your Journal – is maintaining the standard achieved when Stephen (McKeown) was Editor. It is important that it does so – indeed, that it continually improves – since it now reaches institutional World Association of Zoos and Aquariums members and is seen and read by increasing numbers of people beyond the IZE membership itself.

Like the new IZE web site (and congratulations to Web Site Editor Kathy Lehnhardt for all she has accomplished), the Journal is one of the faces we present to others in the zoo world and beyond and it is of prime importance that face is a professional one.

Having said that, I would like to make an appeal. In my time working on the Journal I have been surprised, and a little disappointed at how relatively few IZE members forward articles for consideration. There is so much going on in the field of zoo education – in formal education, in outreach work, in project planning and exhibit design and so on – and bearing in mind the fertile range of ideas and opinions held by educators

around the world (contributors don't need to be IZE members, of course), there ought to be contributions arriving every second day! My appeal is simply for you to make this happen.

Regarding the Journal content this year, you will find one article in Spanish, with an English synopsis. I hope the future editorial team further take on board that our membership is not English-speaking only.

Colin Purrington's article raises some controversial issues. This article came in as our printing deadline was approaching. I decided to include it without, *per force*, giving any of the named institutions a chance to respond to the author's comments. I hope they will forgive me this impoliteness.

I would like to thank the Aguara Guaza Conservation Project, Buenos Aires Zoological Gardens, Argentine, as well as Jackie Ogden, Chris Gentile and Barbara Revard for their contributions – lack of space prevented their inclusion.

Finally, the competition. Why is it that not one person enquired about last year's conundrum? Was the answer so very obvious?

This time there is a prize. We cannot tell you what it is because it relates to the solution; suffice to say it will provide hours of pleasure to the winner. All IZE members who send the correct answer to me before this year's winter solstice will go into a draw for the prize. IZE Committee members are ineligible. I'll give you an inelegant clue: while all the photos are of vertebrates, it sounds like there are invertebrates in the answer.

I would like to thank Alan R Thomson for his usual professional design work, Silvia Geser in the IZE Central office Berne for her vital role in organising the printing, posting and other communications and Stephen McKeown for his help and advice.

A handwritten signature in black ink that reads "Mart = Serafini". The signature is written in a cursive, somewhat stylized font.

The more things change...

by Martin Serafini,

Senior Education Officer, Edinburgh Zoo, United Kingdom



the first five editions had this cover

Here are a few extracts from the first edition of this publication in 1977, at that time called the International Association of Zoo Educators Newsletter (No. 1).

"The production of the first number of any publication is always fraught with difficulties – this has been no exception. What sort of newsletter do members want? What kind of articles and news items are of most use? These questions can only be answered by you and future publications can only be as good as you make them. Should each newsletter have a specific theme such as 'Worksheets' or 'Zoo Graphics'? Would you like some humour? Could we include cartoons or just a few of the funny remarks made by our young visitors?"

from the Editorial by Jan Hatley, Paignton Zoo, UK

"Full members have an annual subscription of \$20.00(US) Associates are \$10.00(US) and Corporate members are \$20.00(US) or their equivalent in other currencies."

from the Secretary's Notebook by James Waddick, Zoological Society of New York, USA

"...it is of vital importance to make people recognize the responsibility of every human being for the preservation of nature, and for the maintenance and restoration of the natural relations between man and the living world. For that reason the social function of a zoological garden or a related institution is to a high degree defined by its educational work."

from the Preamble to the IZE Statutes

"We noticed a rapidly increasing number of visitors in summer 1973. We did not, however, find the visitors in front of the large enclosures of hoofed mammals, for which Hanover's Zoo is well known, and only a few spectators were watching the monkeys. Calves, donkeys, sheep, pigs, goats, Cameroon sheep, rabbits, guinea pigs, fowl, and pigeons proved to be more attractive than even our huge elephant bull and the playing bears. The popularity of these domestic animals was due to the fact that people were allowed to touch and feed them. These animals are kept in the Streichelwiese (petting grounds) which were opened to the public in June 1973.

The project was controversial from the start. ...It was feared that the animals might be teased, beaten, or chased and that they would never have time to rest, which could cause permanent stress. Serious objections also came from the veterinarian who emphasized that the visitors might feed the animals all kinds of indigestible foods. Interestingly no one was afraid that the animals might hurt the children. I myself was sceptical about the scheme.

from Observations of Children in Hanover Zoo's Contact Area by Brigitte Apel, Hanover

Nearly 30 years later, much sounds rather familiar, does it not?

Author's contact details:
Martin Serafini
Senior Education Officer,
Edinburgh Zoo,
Edinburgh,
EH12 6TS, UK
e-mail:
mserafini@rzs.org.uk

Your replica specialist!



K&S Décor has earned a reputation in building true-to-nature replicas of flora and fauna related items. Each desired object can be turned into a safe and educational unit at any possible size. Whether a rock, tree or humpback whale, K&S Décor will astonish you with endless possibilities.

Please visit our website for an extensive presentation.



K&S DECOR :: THE THEME BUILDERS

Internet: www.ksdecor.nl
E-mail: info@ksdecor.nl
Telephone: +31.765.212.200

Mobile: +31.653.331.224
Fax: +31.765.200.923
The Netherlands



Rhinos might be ugly

but they need our help!

by Renaud Fulconis & Susanne Toft Henriksen

of *Save the Rhino International*

Any rhino keeper or zoo educator knows that visitors' knowledge of rhinos is very limited, even confused. "They are carnivores"... "They only live in Africa"... "They are black or white"... "Their horn is made of ivory and is used as an aphrodisiac"... these are just some of the inaccurate comments commonly heard. And if asked what they look like, most would say, "They are ugly!"

Despite the lack of interest and knowledge of rhinos, few activities have been developed in zoos to improve the situation for these large charismatic mammals. This is surprising as rhinos can be found in 86 of the 292 European Association of Zoos and Aquariums (EAZA) member zoos. Why is that? Perhaps it is because they are neither as social as gorillas nor as cute as tigers and they don't entertain us they way penguins do. Yet everyone who works with rhinos finds them the most fascinating of animals, not least because they are (for the white and Indian species) the second biggest land mam-

mal on the planet.

See end of article
for contact details

a great horned (Indian)
rhino in CERZA, France
(credit: G. Lacz)

EAZA

Campaign 2005-6: Save the Rhinos

Perhaps because of its weaknesses as much as its strengths, EAZA has chosen the rhinoceros as the next species to be promoted in its annual campaign, starting in September 2005. Each year, for the past four years, EAZA has coordinated a year-long fundraising and awareness campaign, focusing on a particular conservation issue or threatened species. Past campaigns have highlighted the bushmeat trade, the South American Atlantic Rainforest and tigers, a programme which ran for two years, 2002-4.

The most recent drive was entitled "Shellshock", spotlighting the plight of turtles and tortoises.

Rhinos have been chosen not only because they are found in many zoos but, more importantly, because they are in serious danger of extinction and therefore a major conservation issue.

Threats to rhinos

Rhinos are still being poached for their horn. Nowadays, when efforts to protect endangered species are stronger than ever, they continue to be persecuted. Although the southern white (*Ceratotherium simum simum*) is today the most abundant rhino, with more than 10,500 individuals after being on the brink of extinction a century ago, the last of the northern race (*Ceratotherium simum cottoni*) is



**black rhino (*Diceros bicornis michaeli*)
feeding in vegetation at Massai Mara,
Kenya (credit: R. Fulconis)**



**white rhinos in Lake
Nakuru National Park, Kenya
(credit: R. Fulconis)**

thought to have disappeared from the Democratic Republic of the Congo (DRC) just a few months ago.

In Nepal, as a result of political instability, the Indian rhino is going through a tough time. The population in Chitwan National Park has decreased by 31% in the last five years. Outside sanctuaries, the only way to totally secure rhinos in the field would be to put a police guard on every one – an impossible task! Habitat destruction, of course, is the other major danger that rhinos have to face.

However, it's not all bad news. The eastern black rhino (*Diceros bicornis michaeli*), 87% of which are found in Kenya, is recovering from

the brink of extinction. In 1987, as a result of massive poaching pressure, the population had crashed by 98% from its 1970 level of 18,000. Thanks to a strong conservation and management plan, there are now 540 animals spread over 11 national parks, sanctuaries and reserves. This is just one example of the work being done.

EAZA Rhino Campaign funding

The EAZA Rhino Campaign core group, chaired by Nick Lindsay from the Zoological Society of London, has received 53 applications for funding, from almost every rhino-bearing country, requesting a total of 2.6 million euros. The campaign is currently only set to raise 350,000 euros. Deciding which projects would benefit was really difficult as most of them made a very good case for support. We have settled on 11 projects, involving at least nine countries, and have kept a reserve list in case we raise more money. Hopefully we will, thanks to you all.

Some American zoos are likely to be involved too, through the International Rhino Foundation (a US-based rhino conservation charity). The selected projects range widely and include funding requests for protection units, monitoring and translocation equipment, research, education, community-based conservation and combating trade in rhino horn.

EAZA Rhino Campaign information

With such a wide range of projects, there are many activities that can be developed by zoo education departments. While traditionally it has been difficult to access information about rhinos in the wild, the Rhino Campaign will make fact-finding much easier. Zoo members will receive regular updates from the funded projects. In fact, the EAZA Rhino Campaign Information Pack will do much more than give basic details about rhinos. We have been fortunate enough to work with the very best rhino specialists who have all added to the content, through text or consultation.

Members can look out for updates on the EAZA website (<http://www.eaza.net>), as well as on the EAZA Rhino Campaign site itself, which will be totally dedicated to the campaign. The website will provide some of the information found in the Campaign Pack in addition to many other interesting stories, tips and images, all updated regularly.



a young white rhino scratching his side on a dead tree in Lake Nakuru National Park, Kenya (credit: R. Fulconis)

For more information about the EAZA Rhino Campaign, please contact:

Renaud Fulconis
EAZA Rhino Campaign
Manager Save the Rhino
International
16, Winchester Walk
London
SE1 9AQ
United Kingdom
tel: +44 (0)20 7357 7474
fax: +44 (0)207357 9666
e-mail:
renaud@savetherhino.org

Dr. Corinne Bos
Manager
EAZA Membership Services
and Accreditation
European Association
of Zoos and Aquariums
PO Box 20164
1000 HD Amsterdam
The Netherlands
tel: +31 20 5200753
e-mail:
corinne.bos@nvdzoos.nl

What can zoos with rhinos do to get involved?

So what can the Rhino Campaign bring to education? For one thing, the fact that so much information has been gathered will help you in developing educational activities. We have been working on some and we really hope they will be a good start for you. "Become a Rhino Ranger", for example, is an activity that has been modified from a real-life log book, used in the field by rangers and originally produced by the African Rhino Specialist Group. It is divided in two parts, the first an exchange between the public (children or adults) and the education officer aimed at learning how to become a good rhino ranger and what you have to look out for when meeting a rhino in the field. The second part finds the "rangers" in front of a rhino enclosure in the zoo, when they must find out what the sex, age and body condition of the animals are. They also have to note what kind of behaviour they are observing and draw the ears and horns on an incomplete animal.

We also plan to involve some zoos from the countries where rhinos live, providing them with the Campaign Pack, a most useful resource for any education officer.

What about aquariums and zoos without rhinos?

Rhinos share their habitat with many other species and are seen as a flagship animal. When conserved, many other species benefit from their protection, or the protection of their habitat. Thus other species and habitat provide routes for such institutions to become involved – and we strongly invite them to become part of the team.

Another approach is through hunting for luxury products and oriental medicines, practices which affect so many species, not only mammals but birds, reptiles, fish and invertebrates as well.

Education can and should play a major role in supporting the Rhino Campaign. A strong relationship can be created between rhinos and visitors if we consider that raising awareness of rhino issues is the first step towards conserving them. Widening basic knowledge of these fantastic animals is very important, but itself is not enough. Visitors need to be informed about the dangers that rhinos are facing in the wild. There are just 300 Sumatran rhinos left, about 60 for the Javan – that makes the species one of the most endangered on Earth. How many of our visitors know this? Enthusiasm, fun and total participation will encourage people to spread the word. The work we do during this year WILL make a big difference and we should do our best for that goal!

A bird book just for Johannesburg Zoo

by Louise Gordon,

Education Manager, Johannesburg Zoo, South Africa



pupils make
their bird
observations
with the help
of an education
officer

How exciting to participate in writing a bird book for Johannesburg Zoo. One would think with so many bird books on identification available, why would you want to write another one?

One of our aims is to educate our communities about our surroundings and the animals that we live with. Birding is very popular in South Africa, as I am sure it is in the rest of the world. Most bird books focus on indigenous birds, normally covering certain regions or the entire country.

Johannesburg Zoo's
bird book



guide for beginners" covers the birds found in our zoo, indigenous and exotics, as well as captive and free-flying birds. "Why?" you might ask. The zoo is the easiest place to learn how to identify birds as the captive ones can't fly away. The free-flying birds are often found in your own garden and they can be indigenous or exotic. So we wrote a book to enable the visitor to use our zoo as a learning area, although they can also use the book in their own homes. It is an ideal teaching resource for schools.

To be involved in such a project is very exciting, especially if you have never been party to writing a book. It is an enormous task— hours of research, finding the correct vocabulary, the correct photo with the correct number of pixels, the latest in scientific and common names of birds, and on and on. This is not a task for the faint hearted.

The book follows the same principle as most, providing a short description of each bird, information about its reproduction and habitat plus a colour photo. Conservation in our urban areas is discussed as part of the introduction. It is important for our community to know how to treat the animals that live in our surroundings.

We added a bookmark. The introduction of

most bird books includes a list of characteristics to follow in identifying species. Ours is summarised on the bookmark, overcoming the need of paging back to the beginning of the book time and again. It is handy and easy to use, and keeps your place while you are watching the birds.

A map indicates in which enclosures all the included species may be found within Johannesburg Zoo.

The book is an invaluable resource for schools and a very cost effective product used in conjunction with pupil activity sheets. Learners are invited to a slide show and then accompanied to a bird enclosure to start birding. The sheet is designed in such a way that it includes zoo work as well as activities to do at school or home. It has proved very popular and we are pleased with the results of this programme.

We are proud of this new resource and would like to thank our sponsor, "Sasol Limited" for their generous contribution. Thanks also to the educationists involved in the project – it took many hours of sweat to complete!

Author's contact details:

Louise Gordon,
Education Manager,
Johannesburg Zoo,
South Africa
tel:
(011) 646 2000 ext 254;
e-mail:
louise@jhbzoo.org.za



activity sheets are available for schools to use

Why a cartoon?

- trying a different approach

text by by Carrie Moorcroft and Anya Moon,

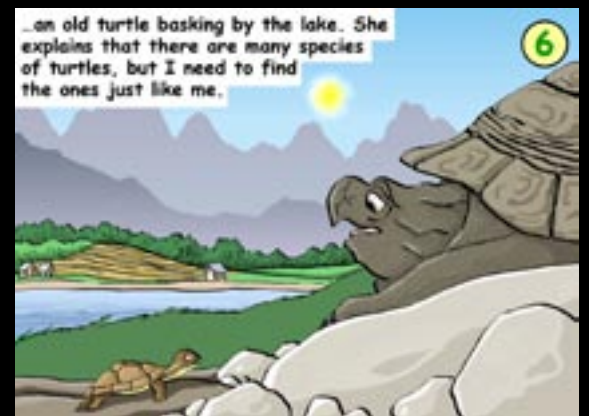
Education Division, Chester Zoo, North of England Zoological Society

Chester Zoo's participation in the ShellShock campaign involved staging an exhibition in our Wildlife Discovery Centre.

The ShellShock campaign materials supplied by the European Association of Zoos and Aquariums (EAZA) included many worrying facts and disturbing images. Although we wanted visitors to understand these and even perhaps be shocked, we did not want to turn them off or have them walk away. So, a cartoon idea was devised as a palatable way of conveying complex and potentially gruesome messages to a family audience.

Hearing about the Yunnan box turtle we decided that this story would be ideal, providing the opportunity to convey many conservation messages but also a potentially happy ending.

With our aim of taking people on a journey, a comic strip in 15 panels was set out around the room, allowing visitors to follow Shelley from baby to adult. Along the way they encounter interactive items, live species, interesting facts and even a live presenter to reinforce the message.



Author's contact details:

Carrie Moorcroft

e-mail:

c.moorcroft@chesterzoo.org

Anya Moon

e-mail:

a.moon@chesterzoo.org

I like being in the lake, but I am not always safe. Look and see what could eat me.

7



Argh!! Help me! I'm trapped in a net!

8

I manage to squeeze through but the fish are trapped and caught.

I swim to the surface and look around. I've been here before, but it looks different. There are more houses with people. What are they doing?

9



12

Oh no, the net again! Argh!!

I'm too big to get away this time. Someone grabs hold of me.



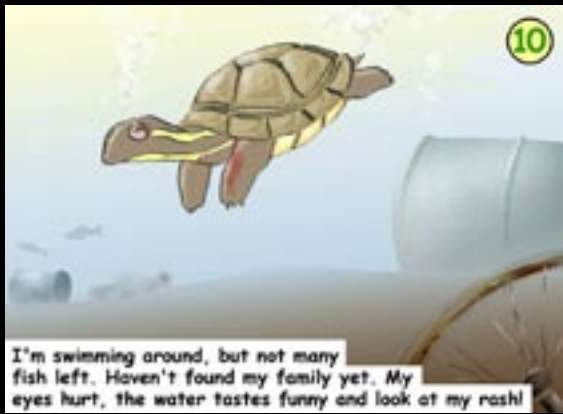
13

I'm thrown into a crate with other turtles. They are not exactly like me, though. I can't breathe, everything hurts, there are too many of us.



14

Now I am dumped onto a counter, with my legs tied. Turtles around me are killed or eaten. Some are taken away.



10

I'm swimming around, but not many fish left. Haven't found my family yet. My eyes hurt, the water tastes funny and look at my rash!



15

I'm gently picked up, looked at and measured. The men rescue me. I find out I'm the only one left! My rescuers hope to find more like me, to save us from extinction.



11

I'm on the surface again and notice the village is now a town, with a big building pumping out smoke.

The End
cartoon by Noel Ford

Playing in the zoo

by Ardaan Gerritsen,

Rotterdam Zoo

It was no surprise that, at the beginning of 2004, Rotterdam Zoo's children's playground was declared unfit. After twenty years of service and more than a million descents down its slide, "Kiboko Jungle" needed to be replaced.

So it was that we patched up the old playground for one more season and started to make plans for a new one. Since it had to be built in our African "continent", it had to reflect an African style. Now, what is a playground in African style? Our educationalists and some other zoo people gathered to do some brainstorming. As well as enjoying ourselves, what follows are the results...

A place for fun

The playground should in the first place be fun, providing opportunities for climbing, sliding, interactions, running and so on. The outside had to remind visitors of Africa – wood, huts, conical roofs. Mulch would be used underfoot instead of sand or rubber tiles.

There were some other requirements, such as building with sustainable materials and the inclusion of a number of apparatuses suitable for disabled children.

The next step was to find a company that could design and build a playground that met our demands. After several selection rounds we came to an agreement with Kinderland in Ede (Netherlands), representatives of Kinderland Germany. Unfortunately this agreement was reached very late in the day – the contract was signed in January and we wanted to open the new playground ("Oewanja Jungle") before May! The delay arose because we had to wait for a sponsoring contract.

In fact, Kinderland and our design team had been looking ahead during the selection process, planning and drawing up a wooden tower with a distinctly African look, filled with nets to scramble in, holes to creep through, walls to climb up, swinging bridges, artificial tree branches and much besides.

Although Kinderland could therefore start construction immediately after the contract was signed, it was nevertheless a miracle that the company managed to finish the job before May. Indeed, it was on April 27th, 2005, that alderman Janssens of Rotterdam opened Oewanja Jungle.

Now, every year the Education Department at Rotterdam Zoo holds an event for children aged six to 12, linked to some topical matter or a newly-built animal enclosure. In the past we have had, for instance, "ZOOlympics", "On the trail of Black Bison" ("In het spoor van Zwarte Bison") and "Egg" ("Eitje"). These events lead children and their parents through the zoo to find clues, answer questions and, above all, have fun. On each occasion the zoo finds itself enriched with new playing materials – giant eggs to sit in, a frame for swinging like a gibbon, a giant weaver nest to hang in, tortoise shells to creep into. These materials are scattered all around the zoo and so children can play everywhere and parents don't have to tear them away from playgrounds to go see some animals.

Pondering a trail

So it was that last year we were pondering what trail or event we might create for 2005. It was our Director in the end who brought up the idea of using play itself as the theme. We happily embraced his idea and created "Safari Oewanja", a game to play in the zoo based on the game of "goose".

Being educators we wanted to make a link between the playing of children (and adults) and animal play – not as easy as it sounds! What is playing? What is animal play? What is the goal of playing? What is its function? Which animals play? When does playing change into more serious conflict?

To find answers to these questions we invited Jan van Hooff, Professor of Ecology at the University of Utrecht, to meet with us. After two hours' discussion with him our basic knowledge of the behaviour called "play" had expanded dramatically. It was only then we could create Safari Oewanja.

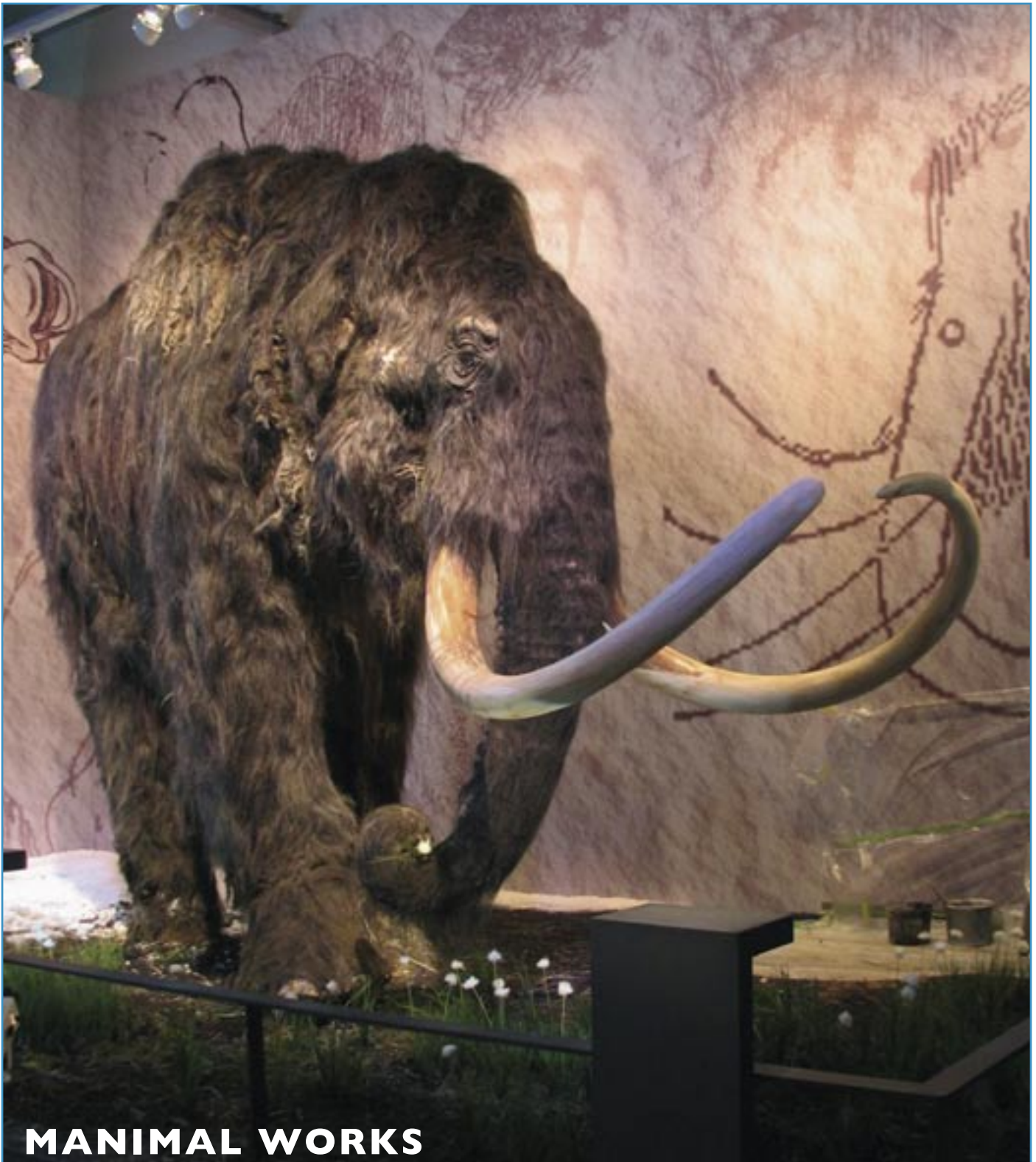
I am sorry I cannot go into all the details of the event here and now (you could always make an appointment with Jan van Hooff!) but let me assure you – Safari Oewanja is scientifically safe, and it's great fun!

Author's contact details:

Ardaan Gerritsen

e-mail:

a.gerritsen@rotterdamzoo.nl



MANIMAL WORKS

Educational models – reconstructions – sculptures – replica's of animals and humans.

Manimal works offers countless options in educational models. You are welcome to visit the website.

www.manimalworks.com



Manimal Works/ R.A. Bakker, Librijesteeg 147, 3011 HN Rotterdam, Tel: 00 31 10 476 6500



Participación del Zoológico Guadalajara en programas educativos sobre conservación

by I.B.A. Ma. De Guadalupe Montiel Figueiras,

Auxiliar Educativo, Departamento Educativo, Zoológico Guadalajara, Mexico

Han sido ya 3 años desde que el Zoológico Guadalajara a través de su Departamento Educativo ha participado activamente en programas de conservación fuera de sus instalaciones, apoyando a los que el Departamento de Educación Ambiental del Acuario de Mazatlán, que en conjunto con el DIF (-Desarrollo Integral de la Familia-: institución gubernamental que apoya el desarrollo de la familia y de la comunidad en México) ha organizado; estos programas son dirigidos a comunidades de escasos recursos económicos, que se realizan con el propósito de sensibilizar y concientizar a niños y niñas sobre la importancia de la conservación de los recursos naturales de nuestro País.

El Acuario Mazatlán, se encuentra a aproximadamente a 6 horas de Guadalajara, ubicado en la ciudad de Mazatlán, estado de Sinaloa, en la costa del Pacífico Mexicano; esta es una institución recreativa y educativa que coincide en muchos de sus objetivos con los del Departamento Educativo del Zoológico Guadalajara; ya que apoya a la protección y conservación de la naturaleza, a través de programas diseñados para niños de primaria, y del programa de Encuentros de la Niñez por la Conservación en apoyo a las comunidades rurales.



Los Encuentros de la Niñez por la Conservación, son la reunión de niñas y niños de diferentes comunidades rurales para vivir un proceso de enseñanza-aprendizaje durante una semana de campamento (sin costo para los participantes), con temas por la conservación de las especies y el medio ambiente, que contribuye al mejoramiento de la calidad de vida, con un programa especialmente diseñado para fortalecer el desarrollo social y humano sobre la base de

valores relacionados con el respeto por el medio ambiente, crecimiento personal y la solidaridad, para que ellos sean capaces de tomar sus decisiones y evaluar la importancia de sus acciones.

Principalmente estos programas de educación ambiental están orientados a la conservación de la tortuga marina, de las aves, y del Golfo de California.

Ha sido de gran importancia el establecimiento de estos programas de educación ambiental orientados a los sectores más necesitados de la población, los cuales por la escasez de recursos económicos no tienen acceso a mucha información, por lo cual uno de los objetivos principales es realizarlos para crear una mayor conciencia y una gran sensibilización acerca de la gran importancia que representan los recursos naturales para todos.



Debido a que la educación es una tarea prioritaria para la conservación, es preciso estar concientes de la necesidad de establecer un balance entre los seres humanos y los ecosistemas de la Tierra; y por lo tanto, esta conciencia debe incrementarse en todos los niveles de la sociedad; los cuales, a través de la sensibilización y concientización de las personas, especialmente los niños, los llevará al conocimiento de los recursos naturales con los que cuentan, así como de la gran importancia de conservarlo.

Mediante este concepto, se realizan 3 campamentos al año, cada uno de ellos con una temática diferente:

- Encuentro de la Niñez de la Zona Sur de Sinaloa por la Conservación de la Tortuga Marina, dirigido a comunidades de 5 municipios costeros del sur de Sinaloa. Establecido desde 1987.

- Encuentro de la Niñez de la Zona Sur de Sinaloa por la Conservación de las Aves, dirigido a comunidades de las zonas serrana y costera de Sinaloa. Establecido desde 2001.
- Encuentro de la Niñez de la Zona Sur de Sinaloa por la Conservación del Golfo de California, dirigido a comunidades de los estados costeros del Golfo de California. Establecido desde 2002.



En cada uno de estos Encuentros se busca que a través de la enseñanza-aprendizaje en una semana de conferencias, talleres, recorridos, visitas a lugares de interés, dinámicas, etc., en donde los niños y las niñas juegan, cantan, aprenden y conviven entre sí, puedan valorar los recursos naturales que tienen, y que adquieran la conciencia de lo importante y necesaria que es su participación en el cuidado y protección de su entorno. Así pues, durante una semana se les brinda a las y los niños participantes, la oportunidad de vivir las emociones y la experiencia personal necesaria de conocer y poder comprender el conocimiento que se les imparte sobre la conservación del medio ambiente.

Otra de las metas es difundir el mensaje de los Encuentros, llevándolo a un mayor número de comunidades, y que los egresados de los encuentros sean pioneros en acciones de protección al medio ambiente y los recursos naturales en sus localidades.

Así mismo, se trata de que cada uno de los instructores o consejeros sean capaces de contribuir para que las niñas y niños adquieran las bases que les permitan ser capaces de tomar las decisiones adecuadas que ayuden a proteger el medio ambiente, a defender sus recursos

naturales y a generar propuestas al alcance de sus capacidades para mejorar su calidad de vida.



De esta manera, los Encuentros de la Niñez por la Conservación son un complemento a la educación formal de las y los niños que participan, y una oportunidad única que les ayuda a comprender y analizar la problemática ambiental de la comunidad. Las actividades que se realizan en cada uno de los encuentros están diseñadas para inculcar valores de respeto y afecto por la naturaleza, propiciar acciones de cuidado y protección de los recursos de nuestro planeta.

La participación del Zoológico Guadalajara en estos Encuentros de la Niñez ha sido de gran importancia, tanto para la institución misma, como para el cumplimiento de las metas de cada uno de estos Encuentros, ya que en cada uno el Zoológico Guadalajara apoya al Departamento de Educación Ambiental del Acuario Mazatlán enviando 1 o 2 instructores, los cuales forman parte del grupo de consejeros que son responsables del buen desarrollo de las actividades, talleres y dinámicas programadas, así como de la convivencia armoniosa entre todos los participantes y a su vez que éstos se involucren y colaboren en todo lo que se haga en el campamento, velando así por el cumplimiento de los objetivos de cada Encuentro.

Asimismo, el Zoológico Guadalajara ha sido partícipe en los Encuentros de la Niñez llevando a cabo talleres en los cuales a los niños y niñas

participantes se les da la oportunidad de poder reforzar de diferentes maneras los conocimientos que van adquirido en la semana a través de conferencias; así pues se realizan *actividades manuales*: como la elaboración de una tortuga, donde para hacerlo necesitan primeramente identificar las diferentes especies de tortugas marinas que existen en México y tener muy claras las diferencias entre cada una; además se llevan a cabo *juegos didácticos*: como el memorama y la lotería de aves, en los cuales de manera gráfica los niños y las niñas aprenden a identificar un gran número de especies diferentes de aves de gran relevancia; así mismo se tiene el juego del twister, donde aprenden la importancia y la relación que existe entre el tipo de alimentación y la forma de pico que tienen las aves, así como la manera de identificarlos; por último también se realizan *dinámicas de sensibilización*, donde el encargado de llevar a cabo el taller es una persona con discapacidad visual, lo cual hace que tenga más impacto en los participantes, pues se les enseña a los niños y niñas diferentes maneras de cómo pueden apreciar su entorno, utilizando no sólo uno, sino todos sus sentidos corporales, para que valoren las diferentes capacidades de cada uno y aprecien lo sencilla y bella que es la naturaleza, y tomen mayor conciencia de la gran importancia de su conservación. Por otra parte, como complemento a esto, se elaboraron 2 canciones que hablan sobre la conservación de la naturaleza, las cuales se han tomado como "himnos" con los cuales se identifican los niños y las niñas de estos Encuentros.



Los resultados de esto han sido muy favorables, pues además de que se ha podido contribuir con la formación de una gran cantidad de niños y niñas, ayudando a generar cambios pro-

fundos en la percepción y conducta de afecto y respeto por la naturaleza, así como inculcando a través del conocimiento y la comprensión de las problemáticas ambientales, la participación de las niñas y los niños del encuentro, en acciones inmediatas en pro del hábitat y sus especies; logrando así un buen aprendizaje en los participantes al conseguir que los conceptos teóricos les queden grabados, que puedan aprender jugando y que tengan una mayor conciencia hacia la conservación de todo su entorno; también la institución, y más directamente, el personal del Departamento Educativo, se ha podido enriquecer en gran medida con la experiencia que se ha tenido con el trato con niños y niñas de comunidades rurales, así como con el intercambio de ideas creativas y dinámicas, actividades de aprendizaje y sobre todo la organización que se requiere para que un programa de esta magnitud tenga un efecto tan grande como lo ha tenido desde el inicio; ya que con todo esto, uno de los objetivos del Zoológico Guadalajara en el futuro será poder llevar a cabo este tipo de programas educativos no sólo en un estado, sino llegando a más lugares de la República Mexicana.



Guadalajara Zoo's participation in conservation education programmes – an English synopsis

It is three years since Guadalajara Zoo's Education Department began participating in conservation programmes outside the institution itself. The programmes concerned are organised by Mazatlan Aquarium, in conjunction with the institution "Desarrollo Integral de la Familia" – a government body that supports the development of families and communities – and are directed at rural communities of low economic resources in the south of the state of Sinaloa.

The aquarium's Education Department seeks to support the protection and conservation of nature through an agenda designed for elementary school children and including a programme called "Childhood Encounters for Conservation". These events bring together children from different communities for a week full of meetings, workshops, games, songs and learning opportunities of all sorts. Three camps are held during the year, each with a different theme, such as sea turtle conservation, the conservation of birds and, focussing on a specific habitat, the protection and management of wildlife in the Gulf of California.

The main aim of the encounters is that, through a process of teaching-learning, the children's awareness is raised about issues concerning natural resources. They are thus encouraged to appreciate their true value and importance. They come to realise a balance must be reached between the needs of humans and the continued survival of ecosystems and that they must play a part in the care and protection of their surroundings.

The encounters provide a unique opportunity for the children, helping them to understand and analyse environmental problems.

The participation of Guadalajara Zoo in Childhood Encounters for Conservation has been of great importance, for both the institution and in accomplishing the aims of the programme.

The zoo supports Mazatlan Aquarium by sending one or two instructors to each of the camps. These instructors form part of the group



of advisors responsible for the development of the various activities and workshops and including arts and crafts, didactic games and awareness dynamics.

The results have been very favourable, contributing to the education of children, helping to change perceptions and behaviours and encouraging respect for the environment. Furthermore, the staff of the zoo's Education Department has also felt enriched through the experience of dealing with children from rural communities, exchanging creative ideas with colleagues and learning about the organisation required for such programmes. In view of these satisfactory outcomes, Guadalajara Zoo's future objectives now include developing similar programmes in other parts of the Republic of Mexico.

The conservation of evolution education in zoos

by Colin B. Purrington,

Department of Biology, Swarthmore College, Pennsylvania, USA

For anyone working at a zoo today, it is no secret that conservation is now the primary focus of educational missions, with the theme influencing all aspects of exhibit design, interpretive labeling, visitor brochures, advertising, guided tours, lecture series and even official zoo logos. Indeed, most if not all of the international organizations of zoos (and aquariums) are devoted to encouraging their member institutions to become even more committed to communicating conservation messages to visitors. Although this increased emphasis on conservation is invariably assumed to be a positive trend, it is worth considering, briefly, what type of educational content has been sacrificed to make room for the conservation message. This article is an exploration of one consequence, the diminished emphasis on evolution education. For example, at the Philadelphia Zoo in Pennsylvania, USA, a facility with approximately 1,600 animals, the words “speciation”, “evolution”, and “natural selection” do not appear on a single exhibit label, while almost 100% of the exhibits, even those of non-endangered species, feature a conservation theme (from personal observations, August 2005).

In evaluating the loss of natural history information it is useful to understand why zoos have adopted conservation as their primary educational mission. There seem to be four reasons. The first is that zoo directors believe that informing visitors about the plight of endangered animals might motivate visitors to become more active in global conservation efforts. The second is that zoos can inoculate themselves against criticism from animal rights activists and other animal welfare organizations by emphasizing that the role of zoos as recreational venues is secondary to their new role as breeding centers for endangered species.

The third is that zoos have simply responded to the public’s increasing appetite for “save the world” themes, lessening the guilt of visitors whose increasingly consumptive lifestyles rather directly contribute to the destruction of the planet’s wilderness areas. Lastly, it’s cheap and easy: designing an educational program that mentions habitat destruction and that publicizes pre-existing, on-site breeding efforts does not require the effort that might normally be involved in exhibit design featuring natural history.

All of the above reasons strike me as reasonable and expected, and none suggests that the conservation theme was simply invented in order to replace evolutionary themes. Still, there seem to be additional factors, independent of the

conservation push, encouraging the extinction of evolution as a popular zoo topic. Some zoo personnel I have spoken to have suggested that evolutionary topics are simply “too hard” for an average zoo visitor to understand. An amusing (and hopefully untrue) variation of this excuse is that label design committees (composed of education staff, graphics people, curators and keepers) invariably contain at least one member who does not fully understand or appreciate evolution, and thus a general impulse for an evolutionary focus becomes derailed due to a lack of consensus. Another popular (albeit strange) reason that is voiced is that properly explaining evolutionary concepts would cause word-limit restrictions on labels to be exceeded. These reasons for actively avoiding evolution seem, to me, to be only moderately convincing.

In the United States (and elsewhere, I suspect, to a lesser degree), there is an additional factor that contributes to the shrinkage of evolutionary content in zoos: the pressure brought by religious fundamentalists. Christian fundamentalists, for example, believe in the literal truth of The Bible, insisting that all animals were created by a supernatural being, several thousand years ago, in their present forms.

The evolution exhibits at the US zoos in St. Louis, Missouri, and in Tulsa, Oklahoma, have both drawn criticism from religious activists, and the latter responded by erecting a disclaimer at the zoo’s entrance that reads,

“There are many views on the origin of biological species and their behaviors. The information that accompanies our displays is based on compelling evidence of the natural sciences. Because scientific knowledge is subject to change, these displays may be revised as new information becomes available”.

This disclaimer greatly pleases fundamentalists because the zoo has suggested that a future experiment might, possibly, show that the world and its denizens were, as Creationists insist, created in six days by an all-powerful entity. This same zoo also briefly planned a creationism exhibit to appease local Christians who were jealous about a statue of Ganesh (an Indian god) near the elephant enclosure. And at the Knoxville Zoo in Tennessee, USA, staff members were instructed to avoid mention of the word “evolution” in educational programs (from private conversa-

Author’s contact details:

Colin B. Purrington

Department of Biology,

SwarthmoreCollege,

Swarthmore,

PA 19081, USA

tel:

610-328-8621

fax:

610-328-8663;

e-mail:

cpurrin1@swarthmore.edu



pages from a book detailing the Genesis creation myth



children at San Francisco Zoo interacting with a label at the lemur exhibit; even pre-readers enjoy graphics about natural history, including evolutionary trees equipped with photographs

tion with former Knoxville Zoo staff member, April 2005). More broadly, The American Association of Zoos and Aquariums (AZA) has recommended to its member institutions, “Don’t alienate people with traditional belief sets”, a directive that is likely to further reduce zoos’ interest in evolutionary themes (see <http://www.aza.org/ConEdHistory3/>). These examples are ones that I could easily uncover with about one month of effort (I have a day job, after all), but I am fully confident that many other zoos have similar stories. And I would not be surprised if zoo staff regularly discuss such pressures from fundamentalists via e-mail and zoo newsgroups, alongside queries about enrichment and diet supplements for their animals.

If evolutionary facts were only remotely related to the educational possibilities of a zoo, then the avoidance of such topics would not be especially alarming or regrettable. But a zoo is often the only place where children can come and witness the diverse end-points of hundreds of millions of years of speciation and marvel at the often bizarre effects that natural selection and sexual selection have had on morphological and behavioral traits. And of all places, the local zoo is the site where young minds might begin to appreciate (with help from parents and appropriate interpretation) that humans are just a minute tip on one branch of an enormous tree of life whose roots began billions of years ago as single cells. In fact, when P.T. Barnum started amassing and touring with exotic animals in the 1870s, local newspapers in the United States made the connection to evolution immediately: “He has crowded natural history into the spectacle of an evening; he has simplified for ordinary minds the Darwinian controversy by bringing all the animals concerned together and leaving them to speak for themselves”.

Another factor that tends to inhibit the use

of evolution in informal learning centers such as zoos is the effect of pedagogy theorists. There is a curious belief in science education circles that evolutionary topics are somehow only appropriate for mature teens and adults. This conclusion is based mainly on the assumption that younger children are developmentally incapable of understanding evolutionary processes. As any parent knows, however, young children are fascinated by the origins of life, of species and of adaptations.

For people without children, a short trip to the local bookstore will provide conclusive proof that young children are ready for this type of information. On the shelves housing religious literature for babies, toddlers and preschoolers, there will be dozens if not hundreds of books that detail myths of creation, of species’ origins, of extinctions and of the causes of adaptations. Children love it. Developmentally, their brains are fully able to absorb the relevance of what is read to them, and they can communicate these myths to other children when asked. Young children absorb scientific knowledge in the same way. Once they know that all animal species evolved from previous species, children develop an insatiable desire to know about the predecessors of their favorite animals. What species did dogs evolve from — a wolf or a fox? Did whales really evolve from land-dwelling mammals, and what did this ancestor look like?

Questions about processes are formulated just as easily. Why did whales evolve to live in the ocean? How many generations would it take to domesticate possums into lovable house pets? The problem is not that very young children cannot conceptualize or appreciate the relevance of evolution, but rather that children quickly begin formulating questions that most parents (and teachers) feel ill equipped to answer. Therefore, if zoos were to retool exhibits to pander to the interests of children, a focus on evolutionary themes would be pedagogically desirable. With their cu-

this graphic on the distribution of Galapagos tortoises is part of a 1,000-word piece on their conservation status; despite the importance of these animals to Darwin's theory of natural selection, evolution is not mentioned



iosity piqued, children might consume far more exhibit label information than they currently do, even if they have to beg their parents to read the signage for them.

Coupled with the many reasons why evolution should go back into zoos are several indications that conservation themes should be scaled back (and not just to make room for evolution). Foremost among these reasons is that conservation issues are often of the “gloom and doom” type that can repel the interest of a casual zoo visitor. Habitat destruction in war-torn regions, rare-animal slaughter for bushmeat and the illegal pet trade are all topics that increasingly dominate exhibit labels to the exclusion of biological information. To make visitors pay attention, and especially to make the visitors donate money to zoo-sponsored conservation projects or to become activists, exhibit designers sometimes make the interpretive graphics even more forceful (e.g., a photograph of an orphaned elephant standing next to a slowly-dying parent whose tusks have just been sawed off by ivory poachers). For the average visitor such a tone can be a step too far, and he or she will simply stop reading the signs.

Part of the problem is that the typical zoo visitor already has a fairly modern view of animals and the challenges they face. Most people know, before they come to the zoo for the first time, that the world's population is increasing at the same time that specialized habitats are disappearing, and that the two facts are not coincidental. And most people believe that citizens should conserve natural areas locally and, if possible, should donate to organizations that do the same on a global scale. In addition to already believing in the ideology behind animal conservation, visitors are bored by any element of signage that seems repetitive. When the Philadelphia Zoo asked a large sample of visitors whether they preferred newer conservation-themed signage to the older plaques that featured natural history, participants in the study voted for the natural history signage, as did the resident curator (from Chambers, P. (1986). Animal identification signs at the Philadelphia Zoo: A research report. Philadelphia Zoo Review, 2(1), 28-44). (The zoo ignored the study results and converted the labels to highlight conservation issues regardless.)

Zoos might also consider the wisdom of exposing young children to too many depressing facts. Developmentally, children who are able to

read labels can also understand – and feel – the sadness brought by evil, loss and suffering. However, because children are helpless in the face of world devastation, such sadness will more than likely be channeled into a desire to stay away from animals so that the feeling does not resurface. Zoos, when their message is too gloomy, are in danger of slowly generating a population of adults that have been traumatized into not caring about the hopeless causes of the natural world.

Zoos, however, often seem to believe the opposite, and that alerting young kids to the bushmeat trade, toxic waste and suburban sprawl will make them, eventually, into adults who can prevent these activities. Naturally, only a long-term study comparing adults who have and have not been exposed to conservation exhibits as children, would answer this question. If ever such a study were made, it would be invaluable to also include a group of adults who were exposed, as kids, to really interesting natural history labels – it is these children, once they grow up, who might translate a profound curiosity of nature into a love of saving endangered plants, animals and habitats.

Given all the reasons why zoos want to push a conservation message – and its appeal to corporate sponsors who wish to put a shine on their public image is not to be ignored here – it is unlikely that zoos will ever fully restore natural history content to labels. But many conservation issues can be pitched in evolutionary terms without too much difficulty. For example, explaining to a viewer that extinction is a natural process might be worthwhile, clarifying the differences between mass extinctions (from meteors, from human activities) and normal (“background”) extinctions. Or perhaps the viewers can be educated about why certain species seem to be responding, via natural selection, to the changes in their environments while other species remain unchanged (and thus remain in danger).

A zoo director who wants to encourage staff to bring evolutionary topics back into education can do so easily. The first is to simply clarify to zoo staff that although a zoo's primary mission might be the breeding of rare species, cooperating on habitat restoration or facilitating conservation research, the educational emphasis should do something more than simply publicize these

part of the interpretation, aimed at young audiences, on marsupial evolution at the National Museum of Australia



activities. Zoo staff, and educational staff in particular, should feel free to include evolution themes in labels to better improve visitor understanding and better integrate with the pedagogical desires of visiting schools. Second, zoo directors can subscribe to several technical journals in which useful evolutionary information is regularly published. Some examples are *Evolution*, *Science*, *Nature*, *Natural History*, *Scientific American*, *National Geographic*, and *Smithsonian* – all serials whose focus is not 100% conservation.

Third, directors might encourage members of signage committees to solicit label ideas from external experts whose primary focus is not conservation biology. Faculties at colleges and universities are generally delighted to be consultants on labels when the featured animal is their research focus, and the Internet makes finding these people easy.

Lastly, zoo directors should initiate more serious evaluation of education offerings, asking specifically whether a conservation-only view of education is truly best for cultivating a love of nature.

Zoos are obviously torn in opposing directions in their need to be recreationally attractive but at the same time appear maximally involved in conservation efforts. Labels that inform visitors of the trade-offs in zoo management might produce a public that is, marginally, more understanding of these trade-offs, and might make it possible for zoos to evolve into institutions that were more devoted to conservation than to conservation education. This, in turn, would allow a greater emphasis on non-conservation education content.

Because there are so many zoos in the world,

and because exhibit labels are rarely available online, part of my interest in writing this article is to find zoo educators who might be willing to share and discuss the signage at their zoos. Because zoos do not directly compete with one another, it seems that if one zoo has an amazing plaque showing how tortoises arrived at the Galapagos Islands and subsequently differentiated into distinguishable subspecies, it could share the text and illustrations with other zoos around the world. Such a site is available at www.flickr.com/groups/exhibitlabels, where photographs of exhibits and exhibit labels can be uploaded (for free), “tagged” with species names and commented upon for the benefit of the world zoo community. Sharing creative ideas with other zoos (and natural history museums) would help peers at different institutions interact at global level.

Another goal in preparing this article is to influence, perhaps, international and regional associations of zoos and aquariums, as well as educational committees and associations whose interests converge on label design, zoo education and the role of informal learning centers in the science education of children. My plea, hopefully evident above, is that highlighting basic biology is important, especially in countries such as the United States where science literacy among the general populace is low. Because evolution is the foundation for all other facts about morphology, physiology, and behavior, zoos should treat it as their primary educational theme. At the very least, evolution should not be completely ignored.

New interpretive displays

in Johannesburg Zoo

by L. Gordon,

Education Manager, Johannesburg Zoo, South Africa

A new master-plan was designed for Johannesburg Zoo in the nineties, although we struggled to develop it due to a lack of funds. Most of the designs were huge new complexes that required a lot of funding.

At the end of 2003, Jenny Gray was appointed as the new Director. An engineering graduate with energy and practicality, she set about re-designing the master-plan as an exciting, achievable project. We still needed a lot of funding, but somehow Jenny started the ball rolling and the rest is now history.

The implications for the Education Department were not apparent in the beginning. We were more used to complaining that we could not do a thing without any budget than actually planning new designs. This all changed with budget allocation...and did our ball start rolling.

What was our task? The zoo would be divided into six new zones – Heart of Africa, Spice Route, Southern Africa, Amazonia, Extreme Environments and the new Children's Farmyard. Our task was to develop informative signage that differed from zone to zone.

The first zone included the Ape House, which needed desperate measures to ensure a larger living space for our chimpanzees. This was the great start of the "Heart of Africa".

The buildings were done in the typical mud style of Africa and various designs were added in earthy colours. The "Celtic" cross was added as it originated in Africa, symbolising earth, wind, fire and water. Mosaic brightened the entire structure in imitation of the use of mirrors in certain parts of Africa. The interior was decorated with wood chips, clay pots and the same mud style with mosaic. We added masks made of recycled drums.

Our signage was developed with a certain theme – the colours would be jungle greens, yellows and browns. The posters would have a specific border to signify the zone, in the case of Africa consisting of masks and jungle plants. The content would be new. Animal information would be included, but we wanted to add more to our visitors' knowledge base. We therefore added information on the bush meat trade. This was a first for us and even though we started quite low key, we had a number of visitor reactions. People were horrified by the idea of chimpanzees being eaten, and of the many other species that suffer the same fate.

Poetry was included – a new dimension to encourage reading and the appreciation of language.

With further progress in the "Heart of Africa" zone, a new poster series was developed, on red river hogs, bongos, situngas, red duikers, Ross turaco and guinea fowl. Poetry was again included and the ecology around a tree. Some interesting facts about pigs concluded the series. Again we used jungle colours in the background, within exactly the same frame.

Technical aspects

Our challenges with designing these exhibits have so far consisted of finding the correct information, portraying it as naturally as possible and saying just enough to educate our public. We also faced the problem of sourcing photographic references available for use free of charge (fees can range from R100-00 to R1000-00 per picture; R100 = £8-34). The picture quality needed to be clear enough to be portrayed on an A1 poster. The posters also had to withstand our climate and so Correx, a highly durable, light material was used. Colour quality was guaranteed for two years, with a 5% fading factor thereafter. The posters were displayed in a clip frame for easy removal and maintenance. Minimal damage has been experienced so far – only two have lost some of their lamination due to extreme weather exposure.

Producing posters in this way also lends itself to recognizing sponsors cost effectively as we simply add their logo to the appropriate poster instead of reproducing a different plaque.

This exercise has turned out to be quite a learning curve for us but has also inspired us to an improved product. We are very happy with our progress so far but need now to implement the next interactive phase – monkey puzzles, feeler boxes, foot prints and biofacts on display will be our next challenge, combined with an "Origin of Man" display.

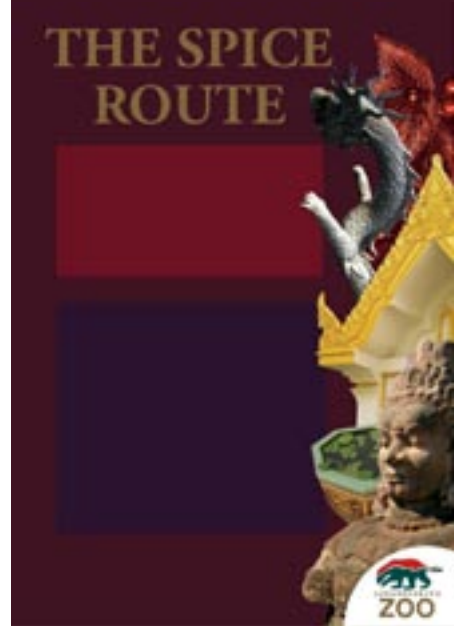
In the meantime, the master designs for the other stages are being developed and we are looking forward to the warm reds of the Spice Route and the bright colours of Amazonia.

Educational displays need to have an effective message, be cost effective and applicable for a few years. They need to follow the particular educational message of the institution concerned and convey the four recognised objectives of any zoo: conservation, research, education and recreation.

We, as the Education Department, find this

Author's contact details:

Louise Gordon,
Education Manager,
Johannesburg Zoo,
South Africa
tel:
(011) 646 2000 ext 254;
e-mail:
louise@jhbzoo.org.za



the Spice Route – another of Johannesburg Zoo's major zones

new phase very exciting, especially as it is the first time that education has been part of the master plan process.

African architecture – a view of the Ape House tower



an ape mask adds atmosphere



Themba displays one of the posters specially developed for the Heart of Africa

A vital role for zoo educators in plant conservation

by Sarah Kneebone

Education Officer, Botanical Gardens Conservation International



plants are a vital part of
the world's biodiversity
(credit: S. Kneebone)

Author's contact details:
Sarah Kneebone
sarah.kneebone@bgci.org
Education Officer
www.bgci.org
Botanic Gardens
Conservation International
199 Kew Road
Richmond
Surrey
England

Abstract

Plants are a vital part of the world's biodiversity and an essential resource for human well-being. They play a key role in maintaining basic ecosystem functions and are essential for the survival of the world's animal life. Yet, despite our reliance on plants, a crisis point has been reached – it is thought that between 60,000–100,000 plant species are threatened worldwide (Global Strategy for Plant Conservation 2002).

In 2002, a Global Strategy for Plant Conservation (GSPC) was legally adopted by all governments who are signatories to the Convention on Biological Diversity. Using a clear set of targets, it provides a framework for actions to bring about plant conservation, sustainable use, benefit-sharing and capacity building at global, regional, national and local levels with the ultimate goal of halting the loss of plant diversity.

Target 14 of the strategy involves “promoting education and public awareness about plant diversity: the importance of plant diversity and the need for its conservation incorporated into communication, educational and public-awareness programmes”. Botanic Gardens Conservation International (BGCI) is the facilitating partner for Target 14 and has been working on consultations to produce targets and milestones for its achievement. As zoos and zoo educators are one of the major stakeholders within the biodiversity education field, BGCI is anxious to gain their input.

Introduction

The Global Strategy for Plant Conservation (GSPC) outlines a series of targets through which the ultimate aim of halting the current and continuing loss of plant diversity can be achieved.

It was initiated at the Botanical Congress in St Louis, USA, 1999, with a call for plant conservation to be recognised as an urgent international priority. Following this, interested parties met in Gran Canaria, Spain, and produced a declaration. The declaration was presented to the CBD, who then agreed that a specific strategy for plant conservation was needed. The initial production of the Global Strategy was in conjunction with many national and international organisations, such as World Conservation Union (IUCN), International Plant Genetic Resources Institute (IPGRI), United Nations Environment Programme (UNEP), the Food and Agriculture Organisation (FAO), WWF and United Nations Educational,

Scientific and Cultural Organisation (UNESCO). Following the GSPC's adoption, these organisations now act as facilitating partners to arrange a series of consultations to agree on sub-targets, practical measures and milestones for each adopted target.

What are the aims of the GSPC?

The specific aims of the GSPC can be grouped into five main themes:

- understanding and documenting plant diversity through databases, monitoring of populations, research
- conserving plant diversity, with both *in-situ* and *ex-situ* programmes, with special attention to conservation of species with direct importance to human societies
- using plant diversity sustainably, involving trafficking controls and supporting the fair and equitable sharing of benefits
- promoting education and awareness about plant diversity
- building capacity for the conservation of plant diversity through networking and enhancing infrastructure and human resources (GSPC 2002).

The strategy outlines the different aspects of these aims in a series of 16 targets. Each of these is explained with terms and technical rationale. It is these outcome-orientated targets, aimed at achieving a series of measurable goals by 2010, and the integration of national and international initiatives specifically related to plant conservation that makes the GSPC unique. This is the first time that such targets have been adopted under the Convention on Biological Diversity (H. Zedan, 2003).

Why would the GSPC be relevant to zoos?

Many of the targets are particularly pertinent to zoos. If your zoo contains any sort of habitat, or runs species-based or ecosystem-based conservation or education programmes, such as the 2001–2002 Rainforest Campaign led by the European Association of Zoos and Aquaria (EAZA), then you are *already* actively supporting the aims and objectives of the GSPC. Likewise, if your zoo is involved with national plant collections, training of horticulturalists, conservation research, is a member of any conservation network or teaches about indigenous knowledge and local traditions, then you are making a valuable contribution towards the fulfilment of the GSPC.



the ultimate aim of the GSPC is to halt the loss of plant diversity (credits: S. Kneebone)

NB: Targets which are starred are those which may be of greatest relevance to zoos; for examples of ways in which zoos support these targets, see text.

Summary of targets for the Global Strategy for Plant Conservation

- Target 1:** a widely accessible working list of known plant species as a step towards a complete world flora
- Target 2:** a preliminary assessment of the conservation status of all known plant species at national, regional and international levels
- Target 3:** development of models with protocols for plant conservation and sustainable use
- Target 4*:** at least 10% of each of the world's ecological regions effectively conserved
- Target 5*:** protection of 50% of the most important areas for plant diversity assured
- Target 6:** at least 30% of production lands managed in a way consistent with the conservation of plant diversity
- Target 7:** 60% of the world's threatened species conserved *in situ*
- Target 8*:** 60% of threatened plant species in accessible *ex-situ* collections, preferably in the country of origin, and 10% of them included in recovery and restoration programmes
- Target 9:** 70% of the genetic diversity of crops and other major socio-economically valuable plant species conserved and associated indigenous and local knowledge maintained
- Target 10*:** management plans in place of at least 100 major alien species that threaten plants, plant communities and associated habitats and ecosystems
- Target 11*:** no species of wild flora endangered by international trade
- Target 12:** 30% of plant-based products derived from sources that are sustainably managed
- Target 13*:** halting the decline of plant resources and associated indigenous and local knowledge, innovations and practices that support sustainable livelihoods, local food security and health care
- Target 14*:** the importance of plant diversity and the need for its conservation incorporated into communication, educational and public-awareness programmes.
- Target 15*:** the number of trained people working with appropriate facilities in plant conservation increased, according to national needs, to achieve the targets of this strategy
- Target 16:** networks for plants conservation activities established or strengthened at national, regional and international levels

Which targets are relevant to zoo educators?

Many of the targets mentioned above also have relevance to zoo educators through their vital work in raising awareness about conservation issues in the general public. Targets 14, 15 and 16 are all “cross-cutting” – they are achieved as part of all other targets within the strategy. Naturally, however, it is Target 14, the incorporation of the importance of plant diversity into public awareness programmes, which is of greatest interest to educators.

Zoos have an enormous audience of approximately 600 million per year (Dollinger, 2002). By using inspirational stories about plants and by fostering increased interest and understanding about the relevance of plants (both within and outside the zoo collection), zoo educators can, and already do, make an enormous contribution to Target 14.

Targets 4 & 5

Lahore Zoo in Pakistan has an *in-situ* conservation project for the rescue of stranded Indus River dolphins, involving conservation of habitat. Zoo Ljubljana, Slovenia, is situated within a protected area of national forest, partially managed by the zoo (Kneebone, 2004).

Target 8

Paignton Zoo is funding a member of its science department to undertake a PhD investigating the biology of the meadow thistle – a key species in a rare Devon habitat. In addition, it has a plant collection of 5,000 plants from 1,500 species (Paignton Zoo, 2005). Dublin Zoo holds 20 IUCN Red List plant species, including the Chilean monkey puzzle tree which is rare in its native Chile and Argentina (Dublin Zoo, 2005)

Target 10

Sweden's Parlien Zoo runs education programmes which talk about the ecological problems caused by the introduction of alien plant species and actions to avoid this danger (Kneebone, 2004).

Target 11

Oakland Zoo in the USA has developed a 4th-grade curriculum, public programmes and docent training on endangered species and the tourist trade (Kneebone, 2004).



top: a display at the Montreal Botanical Garden illustrates Target 14 – the importance of plant diversity incorporated into public awareness programmes
middle: Target 11 aims to protect plant species, including orchids, from illegal trade
bottom: Target 9 of the GSPC illustrates the importance of maintaining genetic diversity of crops & associated indigenous knowledge (credits: S. Kneebone)

Target 4 – at least 10% of each of the world's ecological regions effectively conserved
(credit: S. Kneebone)



Target 13

Indigenous and local knowledge about plants has been included on some interpretation in the new jaguar exhibit at Chester Zoo, UK, while Moscow Zoo in Russia works with the Museum of Biology, collecting folklore items and producing projects and performances based on them (Kneebone, 2004).

Target 14

Dublin Zoo ran an exhibition called “Green Scene” in 2004, which had 40,000 visitors. A repeat in 2005 attracted 71,000 (Butler, 2005, pers. com.).

Yokohama Zoo in Japan runs a lecture for university students on the importance of plants and has a hands-on exhibit in the zoo (Kneebone, 2004).

The Belo Horizonte Zoo and Botanic Garden provides signs, educational activities, talks and plays about the life of plants and animals, highlighting the relationship between humans and nature (Evangelista, 2004).

The education department at San Diego has created several “teaching gardens”, including a butterfly garden and a vegetable garden, which are used for education programmes for visitors from three years old and up (Furry, 2004).

However, you don't actually need to develop your own garden area within the zoo to help deliver a conservation message about plants. Several zoos have joined forces with other local sites to provide their school groups and visitors with a more holistic experience. One example is that of the very popular five-day ZooBot Camp, run in summer for children around Tucson, USA. Mornings are spent behind-the-scenes with art projects and science experiments at Reid Park Zoo, while in the afternoons participants find botanical inspiration at the Tucson Botanic Gardens.

More information and examples of how zoos are effectively supporting the targets of the GSPC can be found on the BCGI website:

http://www.bgci.org/education/what_zoo_doing.html

What are the implications for zoos?

There are many aspects of work for the Global Strategy for Plant Conservation that zoos and zoo educators can become involved with and use to their advantage:

- supporting the development of education programmes to implement Target 14
- developing the capacity of all staff to implement Target 14
- ensuring that educators are represented in workshops concerned with the implementation of other GSPC targets
- becoming involved with stakeholder meetings within their country
- working with *CEPA** to implement Target 14 (e.g. publicise the work of zoos, act as an advisory body)

**CEPA* is the Communication, Education and Public Awareness programme, created by the CBD to address Article 13, i.e. education about biodiversity. The CEPA portal website address is <http://www.biodiv.org/programmes/outreach/cepa/home.shtml>

Conclusions

The Global Strategy for Plant Conservation is an ambitious and important agreement with the overall aim of stopping the loss of plant biodiversity. In order to achieve this goal, many organisations and stakeholders need to work together. With their plant collections, existing conservation work, education programmes and huge numbers of visitors, zoos have an important role to play in the implementation of the Global Strategy for Plant Conservation. BCGI is keen for zoos to become more involved in the consultations and stakeholder processes currently taking place and for zoo educators to take the ideas and implications of the GSPC back to their organisations for further consideration and action.

For any more information on the Global Strategy for Plant Conservation contact BCGI:
www.bgci.org
julia.willison@bgci.org
sarah.kneebone@bgci.org

BGCI is a not-for-profit organisation which networks organisations concerned with plant conservation. These include mostly botanic gardens, but we also have a number of zoological gardens including San Diego, Paignton, Chester and Bristol. We provide support, advice, grants, manuals and training courses, allowing members to improve their capacity and work in plant conservation.

References

Many thanks go to the members of IZE who took part in the questionnaire on their zoos' programmes and the GSPC.

Dollinger, P. (ed.) (2002) *'What is WAZA'*; WAZA facts, WAZA, Bern - Switzerland

Dublin Zoo (2005) *'Endangered Plants'*, Dublin Zoo website (http://www.dublinzoo.ie/come_plants_endangered.htm, accessed 14th April 2005)

Evangelista, L. (2004) *'Building an interest in plants and animals'*, *Roots*, 1 (2), Botanic Gardens and Zoos; Synergies for the Future, BGCI, London

Furry, L. (2004) *'The REAL reason to visit the zoo'*, *Roots*, 1 (2), Botanic Gardens and Zoos; Synergies for the Future, BGCI, London

Kneebone, S (2004) *'A vital role for zoo educators in plant conservation: the Global Strategy for Plant Conservation and you!'* (http://www.bgci.org/education/IZE_paper.html, accessed 14th April 2005)

Paignton Zoological Gardens website (2005) *'Paignton Zoo Botanic'* (www.paigntonzoo.org.uk/plants/default.asp, accessed April, 2005)

Secretariat of the Convention on Biological Diversity (2002) *'Global Strategy for Plant Conservation'*

Van Peenan, V. (2004) *'ZooBot Adventures: a unique collaboration'*, *Roots*, 1 (2), Botanic Gardens and Zoos; Synergies for the Future, BGCI, London

Wyse Jackson, P. (2003), *Progress in the implementation of the Global Strategy for Plant Conservation*, *Botanic Gardens Conservation News*, vol. 3, no. 10

Wyse Jackson, P. (2001), *Progress towards a Global Strategy for Plant Conservation*, *Botanic Gardens Conservation News*, vol. 3, no. 6

This paper is adapted from a presentation given at the International Zoo Educators Congress, Hong Kong, September 2004 and from a paper entitled 'A vital role for botanic garden educators in plant conservation', published in *Roots* 2:1 'International Agendas: Implications for botanic garden education'. It can also be found on the BGCI website at http://www.bgci.org/education/IZE_paper.html



top: lively and informative interpretation on plants supports Target 14 of the GSPC (credit: E. Mole)

bottom: zoos have an important role to play in the GSPC - Bristol Zoological Gardens is already involved, with plant based interpretation (credit: E. Mole)

Environmental enrichment

and getting people closer to *ex-situ* conservation –

a report on Animal Day at Lisbon Zoo

by Telma Araújo, Vera Sequeira,

Education Department, Lisbon Zoo, Portugal

In 2004, Lisbon Zoo commemorated Animal Day, a four-day event with a set of unique activities built around a single theme – environmental enrichment. The main goal of this event was to open up our visitor's minds to the importance of animal welfare and to the essential role played by zoos in species conservation.

how we did the Animal Day

The conservation effort made by every worker in Lisbon Zoo is normally unappreciated by the majority of our visitors, who come to us in search of a different and pleasant leisure day, in a beautiful setting, surrounded by unique animals.

We all know that changing people's minds is not easy and, if the majority of the Portuguese population does not yet see their zoo as a place where species conservation happens daily, we will have to work harder in order to transmit that message.

The Animal Day, an invitation to visit Lisbon Zoo, undoubtedly provided a great opportunity to present to the public our role in nature conservation!

With this goal in mind, it was essential to plan a unique and dynamic day at the zoo filled with new opportunities and experiences that would attract as many people as possible and assure the participation of everyone, even the most distracted visitor!

Our objective was to show to the general public how we cater for our animals' welfare, presenting to the public some examples of environmental enrichment already in place in many of Lisbon Zoo's enclosures.

The purpose of environmental enrichment is, of course, to allow animals to exhibit as many of their natural behaviours as possible, both for their own welfare and for educational reasons. Enrichment can challenge animals, improving their ability to cope with new situations. In this way it can be essential preparation for possible future reintroductions to their natural habitat.

This is a reality for an increasing number of species at Lisbon Zoo, providing valuable opportunities for our visitors to see – to be amazed by – the range of behaviours exhibited by different species, be it ways of moving, feeding methods, social interactions and communication or whatever.

In this way, through empathic experiences and in greater proximity to the animals, we can hope to increase our visitors' level of knowledge

about the animals with which we share our planet. This can only lead to a growing will to conserve nature and to look upon zoos as a critical part of that process.

And so our work began!

The preparation involved several departments: the Zoological and Veterinary Services, Nutritional Services, Animal Collection Services, Marketing Services, Commercial Services and Educational Services.

The activities were planned, discussed, tested and carried out through teamwork, gathering the best from every department.

With a focus on nutritional enrichment, we selected four species in which activities would be most attractive from the public's point of view, with a compatible schedule so that visitors could normally assist. To accomplish our goal of demonstrating the work being carried out in Lisbon Zoo for the improvement of animal welfare, it was extremely important to have the collaboration of the keepers and Nutritional Services in determining the most appropriate choice of "snacks" so that the animals could celebrate (their) Animal Day.



a ring-tailed lemur (*Lemur catta*) keeper soaks dry fruit and dates in honey

Author's contact details:

Vera Sequeira,

Education Department,

Lisbon Zoo, Portugal; tel:

351 217 232 960

e-mail:

Vsequeira@zoolisboa.pt



**a brown bear (*Ursus arctos*)
enjoys ice blocks thrown, under
supervision, by visitors**

Animal Day environmental enrichment programme

day	selected species	activity
Saturday 02/10/2004	Bennet's wallaby (<i>Macropus rufogriseus</i>)	hanging and pinning food (apples, lettuce, carrots) to several appropriate furniture items in several locations around the enclosure
Sunday 03/10/2004	brown bear (<i>Ursus arctos</i>)	placing ice blocks containing fruit (apples and pears) or fish
Monday 04/10/2004 Animal Day	meerkat (<i>Suricata suricatta</i>)	placing in the enclosure kits made with cardboard egg boxes or cardboard tubes, containing shreds of paper and mealworms
Tuesday 05/10/2004 Portuguese holiday	ring-tailed lemur (<i>Lemur catta</i>)	placing of small wooden rafters with small cavities in which were hidden several food items (such as dry fruits and dates) soaked in honey

The activities were accompanied and guided by Filipa Baptista, one of our Lisbon Zoo guides, who had received the preparation and information required for this task. The Education Department created guidelines for all the major topics to be covered.

So that all the public could follow the activities and hear Filipa's talk it was necessary to install sound equipment. Several rehearsals were gone through, in order to assess the animals' reaction to the presence of a large number of people, to the sound equipment and to the activity itself to ensure that everything went as planned on the day.

These rehearsals were also essential to adjust the timetables of the several participants, and co-ordinate the various tasks involved, from the preparation of the environmental enrichment kits to locating them in the enclosures to the study of each species' behaviour and interest.

Filipa had also the opportunity to get acquainted with the reactions of the animals so that she could easily and more adequately explain them later to the public.

All the steps mentioned above proved to be of tremendous importance since various factors could influence the duration of the activity (which

shouldn't exceed 15 minutes) and lower the interest of the public. Ideally, it should neither be too short, nor too long!

It was in this way our "Zoo Talks" programme was born.

"Zoo Talks" programme

During these days Lisbon Zoo was a very animated place.

For Animal Day itself we had a very special party prepared: all the "godfathers" (people that have adopted an animal) of the four species chosen for the event were invited, as well as the companies that have given support to Lisbon Zoo in the pursuit of its goals.

At the entrance visitors were received by several animators dressed up as animals. They were handed an informative leaflet about environmental enrichment, explaining why it was we were doing these activities and with pictures of everyday tasks at the zoo.

During the "Zoo Talks" the audience were invited to participate in the enrichment activities and they became more elaborate, giving the visitors a real insight into the kind of work going on daily.

a keeper hangs food (apples, lettuce, carrots) for Bennet's wallaby (*Macropus rufogriseus*) on enclosure furniture



Animal Day had an enormous impact in the media who, from an early stage, took great interest in it. It received wide coverage in the papers, magazines and even on television, attracting a larger number of people and allowing us to go even further in the pursuit of our goals.

Always recycle

Whenever it's possible, in the environmental enrichment programmes we recycle items of everyday use, effectively increasing the materials' useful life.

With media collaboration, we asked our visitors to participate in the "three Rs" policy – Reduce, Re-use and Recycle – by bringing cardboard tubes from kitchen rolls, cardboard egg boxes and old socks (these are some of the materials used in our environmental enrichment activities).

The response was so great that we are still receiving phone calls and e-mails from students, families and individuals who have collected materials and want to know how they can deliver them to the zoo and so contribute to the animal welfare project they have heard so much about.

In the end...

Public feedback from the "Zoo Talks" has indicated a very positive impact, and we believe we have managed to achieve all the goals for which Animal Day was created.

It is always good to feel that the message that zoos are now fundamental to species conservation has reached a wider audience and that each of us, with simple and small gestures, can contribute to a better world.

ring-tailed lemurs being kept busy with their enrichment



ice blocks containing fish and fruit

“Masoala Rainforest”

and visitor education

by Roger Graf,

Head of Education, Zurich Zoo, Switzerland



the exhibit area
is 1.1 hectares,
the roof is 32m in
height

Zurich Zoo’s “Masoala Rainforest” isn’t an extraordinary project solely in terms of construction, enterprise and maintenance, but is also very special in terms of the zoo visitors’ education. By providing a natural experience in a most authentic habitat, the ideal primary goal being is to sensitise all zoo visitors to the threat to the rainforest and thus motivate them to contribute a voluntarily amount towards the conservation of these forests.

To achieve this goal, the visitor is led through the following four zones:

Acclimatisation – the underground visitors’ passage

Experience – the actual hall

Understanding – the information centre

Action – the foyer, restaurant and zoo shop.

In a roughly 60m underground passage, visitors are acclimatised to the natural experience of the “Masoala Rainforest”. Under the title, “The

deserted primeval forest – a myth”, a surprising theme is taken up in preparation for visiting the rainforest. The predominant flora, the evolutionary history of Madagascar and the threats faced by species at risk are three further themes. Large images, quotations from scientists and a few facts and figures intentionally focus on the essential information.

The visitor now enters the heart of the project – the actual hall – through a sluice. Here, we specifically decided not to use the species labelling methods commonly used in zoos and botanical gardens. Authentic natural experience, using all the senses of smelling, seeing, hearing and feeling has absolute priority. In two explorer camps, visitors get the chance to identify and discover the animal species by themselves, using specially created guidebooks, while the use of telescopes makes the observation fun and enjoyable. This presentation concept is unique

Author’s contact details:

Roger Graf

Head of Education,

Zurich Zoo

e-mail:

roger.graf@zoo.ch

tel:

0041 44 254 25 35



top:
a traditional
Malagassay hut
far right:
log boats, or pirogen
middle:
Zurich Zoo's "Masoala
Rainforest" under
construction in the
spring of 2003
above:
FSC-accredited wood
element with head
phones at the
information centre

and, for some visitors, unfamiliar. Imported huts (research camps and traditional houses), pirogen (log boats) and railroad tracks illustrate a variety of human activities in the rainforest.

In a smaller area, economically important plants such as vanilla, papaya, coffee, pepper and banana grow, to name just a few. We have even planted a small paddy field. Rice is a staple food, but unfortunately also the biggest ecological problem in Madagascar.

Through the sluice visitors leave the heat and humidity and enter the information centre, at which point understanding on all aspects of the subject can be reached. The many causes, attitudes and possible solutions to the problem of deforestation are examined through several exhibition pieces, interactive elements, a cinema and terrariums and aquariums.

In the design of the exhibition, emphasis was put on a pleasant atmosphere so that visitors feel comfortable and stay within the space for a longer period.

At the end of the exhibition, we ask the visitor for their financial support for conservation, including development aid projects in Masoala.

In the first half of 2004 we raised FF45,000 (US\$8,497, Eur6,860) through this method. The idea and content of the exhibition was developed through close collaboration between Zurich Zoo's Education Department and the Zurich-based firm Formwerk AG. All wood elements are Forest Stewardship Council accredited. Information in the visitor's passage and in the exhibition area are principally written in German, French and English.

Finally in our visitors' centre our guests are offered food and drink, while arts and crafts are offered for sale. We are making sure that these products derive from fair trade practices and have been produced in as ecologically sound a way as possible. Part of these takings (2% of the turnover) is allocated to our project in Madagascar.

After one and a half years of operation we would like to offer the following comments on the construction and maintenance of the facilities:

Visitors' passage

- The lighting of the facility name in the passage isn't optimal as it is affected by the changing daylight glare.

Hall

- The Ravenala-leaf roofs of the research camps and huts rot very fast, the reason perhaps being the constant high humidity. We sorted this ourselves by fitting foils and mending the roofs using spare materials.

- Lemurs have damaged the interior decoration in the traditional houses. We discouraged them by fixing objects in place.

- The maintenance of the paddy field proved simpler than expected, although occasionally ducks damage the young rice plants.

- Direction signs for the two passages away from the hall aren't ideal and quite a few visitors miss the information centre, taking the direct route to the restaurant.

- The absence of traditional species labelling has evoked less criticism than feared. The authentic presentation of the rainforest habitat is very well received by the visitors.

Information centre

- A certain amount of maintenance has been required for a number of the electronic media devices employed in the exhibit as a result of wear and tear and, perhaps, wilful damage.

- The slides shown in the exhibition are already bleached out; by installing a UV-filter we are hoping for a longer operation time.

- At the information centre, we've only installed a few electronic media devices, working much more with mechanical elements, such as rollers and drawers. This has been excellently received and has meant lower maintenance and running costs.

- We have experienced surprisingly little damage to signage, interactives, etc as a result of visitor behaviour.

- The detailed, informative panels are well used and hold guests staying for long periods.

Oarsome

aquatic adventures

by Yvette Finlay,

Education Officer, Werribee Open Range Zoo, Australia

Imagine gently gliding along a river in a Canadian canoe past overhanging 200-year-old River Red Gums. As you paddle down the river, you experience a chance spotting of a meandering platypus beneath red, dirt cliffs, which rise over 30 meters above the water's surface. You can experience all these on the Werribee River by taking part in "Oarsome Aquatic Adventures", a schools program developed by educators at the Werribee Open Range Zoo.

The Werribee Open Range Zoo is located on the Werribee River, 4km northeast of the river's mouth. The river has played a major role in shaping the land and providing an interesting landscape, particularly the grazing areas on the flood plain. The source of the Werribee River lies at the base of the Great Dividing Range, within Wombat State Forest, 10km south of Daylesford. The river flows southeast through Ballan, Bacchus Marsh and Werribee over a distance of approximately 110km, then out through its mouth into Port Phillip Bay. "Werribee" is an indigenous Aboriginal term for backbone or spine, indicating its importance to the region.

The Werribee River catchment is an important natural and human resource for Melbourne's western metropolitan area. Werribee River is utilised for recreation such as swimming and fishing. It is also largely relied upon for irrigation of agricultural areas and tourist precincts such as Werribee Open Range Zoo, the Equestrian Centre and the Mansion at Werribee Park. A valuable resource for the Zoo property, the river is utilised by the zoo site for canoe safaris and irrigation.

Human impact

"Oarsome Aquatic Adventures" is an environmental adventure that has been designed to provide participants with an opportunity to focus on rare and endangered species, human impact on the environment, past and present ecology of the Werribee River and the historical and cultural aspects of the Werribee area.

This adventure is experienced in a unique and environmentally sound manner, by touring in Canadian canoes on the Werribee River. The program targets students studying Environmental Science, Biological Science and Outdoor Education in years 10, 11 and 12, but is open to all secondary school students.

The aims of the program are to promote awareness of our waterways and the ecosys-

tems within them and for students to develop an understanding of the appropriate physical, chemical and biological environmental indicators that are used to measure the quality of a river.

We also aim to determine how effective the Werribee River restoration project has been in relation to the following objectives:

- improving the quality of the water within Werribee River at the zoo site
- eradication of introduced species
- creation of habitat through the regeneration of indigenous plants, and- regeneration of populations of indigenous animals.

Safari tour

The program consists of a 2 1/2-hour canoeing and a 50-minute guided safari tour of the zoo. When planning for the tour, you are advised to allow a minimum of four hours for your zoo visit. Students examine water samples taken from the river; hence appropriate fieldwork clothing and sunscreen is desirable.

Prior to launching canoes students are taught basic safety instruction and guided in the basic stroke technique. Once on the water students are briefed on capsizing drills on the water (students do not have to capsize for this drill) and then begin canoe touring and river interpretation led by the guide. Water quality testing for accurate data to send to Waterwatch is also conducted on the river.

Werribee Open Range Zoo provides one experienced staff member for groups of less than 15 students and two staff members for groups greater than 15 students. These numbers are based on the Department of Education and Training and Catholic Education Office outdoor activity guidelines that recommend a ratio of one staff to six students (1:6) when on water. A minimum of two staff should always be present at the activity. Werribee Open Range Zoo can cater for a maximum of 23 students, three staff and two experienced zoo guides.

Teachers can access "Oarsome Aquatic Adventures" zoo resources on line by visiting www.zoo.org.au. These resources contain water quality testing data sheets and Grassland Quadrat survey sheets. These may be used in any waterway or grassland environment close to schools.

Through the support of BHP Billiton and their staff, Werribee Open Range Zoo has been able

Author's contact details:

Yvette Finlay
Education Officer,
Werribee Open
Range Zoo,
Australia



adventure on the
Werribee River

to implement a schools program of environmental significance. Such programs help students to learn that if managed correctly, wetlands can sustain a reasonable demand for agricultural, industrial and domestic water, whilst serving their natural role as a habitat for a large variety of wetland creatures, reducing the impact of floodwaters and maintaining the soil. More recently, there has been an increase in community awareness of the values and needs of wetlands. New approaches to management are being developed and work is being done to rehabilitate damaged and degraded wetlands.

for your information

The documentary film *The Last Journey for the Leatherback?* is available on either video or DVD to teachers and educational organizations for a special discount of \$10 with a free downloadable teacher's kit. A copy can also be downloaded to your PC (sorry, it doesn't work with Macs) for only \$5 (teacher only price for a limited time) and will play as many times as you like. Please send us a copy of the class activity so we can deliver it to the United Nations.

To order a copy of the film go to:
http://seaturtles.org/press_release2.cfm?pressID=220

To download the teacher's kit go to:
<http://www.seaturtles.org/pdf/ACF173.pdf>

Quiz

**? Five animals- what's the connection?
See Editorial for more information**

Executive Committee

for 2004 - 2006



President

Chris Peters,
Rotterdam Zoo, The Netherlands
c.peters@rotterdamzoo.nl

Immediate Past President

Annette Berkovits,
Wildlife Conservation Society, USA
aberkovits@wcs.org

President Elect (Vice President)

Stephen McKeown,
Chester Zoo, UK
s.mckeown@chesterzoo.org

Secretary

Elena Boadas,
Barcelona Aquarium, Spain
eboadas@aspro-ocio-es

Editor

(until December, 2005)
Martin Serafini,
Edinburgh Zoo, Scotland
edofficers@rzss.org.uk

Treasurer

Gerda Vest Hansen,
Givskud Zoo, Denmark
gerda@givskudzoo.dk

Regional Representatives

Europe/Middle East

Gaby Schwammer,
Schoenbrunn Zoo, Austria
gschwammer@zoovienna.at

Africa

Herbert Kebafetotse,
Kalahari Conservation Society, Botswana
herbza2000@yahoo.com

Australia/New Zealand

John Gardner,
Adelaide Zoo, Australia
jgardner@adelaidezoo.com.au

Regional Representatives (continued)

Asia

Flora Hsu,
Taipei Zoo, Taiwan
florahsu@mail.zoo.gov.tw

North America

Tom Naiman,
Wildlife Conservation Society, USA
tnaiman@wcs.org

Latin America

Maria Martinez,
Guadalajara Zoo, Mexico
mmartinez@zooguadalajara.com.mx

Regional Journal Editors

Europe/Africa/Middle East

Louise Gordon,
Johannesburg Zoo, South Africa
louise@jhbzoo.org.za

Australia/New Zealand/Asia

(until February, 2005)
Melissa de Britt,
Taronga Zoo, Australia
mdebritt@zoonsw.gov.au

The Americas

Marcelle Gianelloni,
Louisville Zoo, USA
marcelle.gianelloni@loukymetro.org

Website Editor

Kathy Lehnhardt,
Disney's Animal Kingdom, USA
kathy.lehnhardt@disney.com

2006 Conference Host

Willie Labuschagne,
National Zoological Gardens of SA, South Africa
willie@zoo.ac.za

Ex-officio Member

(until June, 2005)
Henning Julin,
Aalborg Zoo, Denmark
hju@aalborgzoo.dk

ISSN: 1040-5208



www.izea.net