

The Third Asian Zoo Educators' Conference 第三屆亞洲動物園教育者研討會

Focus On Rainforest · Eco-System Thinking

森活·森命·森呼吸



September 18-22, 2011

Presentation Abstracts 論文摘要

Host 主辦單位	Taipei Zoo 臺北市立動物園
Supervising Organization 指導單位	Forestry Bureau, Council of Agriculture Executive Yuan 行政院農業委員會林務局 Taipei City Government 臺北市政府 Department of Education, Taipei City Government 臺北市政府教育局
Co-organizer 協辦單位	Taiwan Aquarium and Zoological Park Association 臺灣動物園暨水族館協會 Taipei Zoological Foundation 財團法人臺北動物園保育教育基金會 臺北市立動物園之友協會
Commissioned Unit 委辦單位	Society for Wildlife and Nature 中華民國自然保育協會
Outdoor Visit 參訪單位	Dongyanshan Nature Education Center 東眼山自然教育中心 Leofoo Village Theme Park 六福村主題遊樂園

Paper Presentation Abstracts

Monday, September 19, 2011

Session 1

Moderator: **Bill Street**, *SeaWorld Parks and Entertainment*

1-1

Zoo As a Living Classroom

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Worldwide Zoos provides a multiplicity of opportunities to educate a great variety of people and groups of all ages and levels. The most basic form of conservation education includes informing the public about the threatened status of the species of zoo animals their habitat ecology, and other animals which are taxonomically or geographically related. Conservation Education is tied closely to the environmental and social characteristics of the target group itself.

The National Trust for Nature Conservation (NTNC) is trying to develop skills and attitudes towards urban environmental issues through the Friends of Zoo programme in the Central Zoo. The Friends of the Zoo programme started with a view to raise love and affection towards the Zoo and its animals. Over the time, the programme also incorporated some of the urban environmental issues interlinked into conservation education. The success of the Friends of the Zoo programme has been indicated by annual increase in the number of FOZ members. At present, the zoo has been able to enlist more than 20,000 FOZ members and has an effective network with more than 200 different schools of the Kathmandu, Lalitpur, Bhaktapur and Banepa.

Being the member of the Friends of the Zoo, students can participate in various activities of the Conservation Education (CE) programme such as: Wildlife Essay Competition, Drawing Competition, Quiz Competition, Zoo Night guided Tour, Educational Tours to National Parks, Winter and Summer Camps, Animal Feeding at the Zoo. The students are also involved in various other environment related activities such as solid waste management training, bee keeping training, tree plantation, clean up campaign, celebration of World Environment Day etc. The present CE programme has given a unique opportunity to acquire practical environmental knowledge. In fact, the programme directly contributed to the FOZ member schools that are running an environmental education curriculum in a classroom based approach.

Considering the success of the Friends of Zoo programme and recognizing the strong network of school students, NTNC has also launched the plastic bag ban campaign. The campaign was

initiated with a view to stop the use of black plastic bags which in recent years has been a curse to the Zoo with its ill effect of being eaten by the animals and being killed by the obstruction in intestine. The program is running successfully with the support of public and Zoo now is almost plastic free zone and has become a role model to other parks in the valley.

Thus, the Central Zoo under the NTNC management is getting a positive response worldwide and nationwide by attracting the potential donors for its various development activities and is moving forward with an aim to establish itself as a Centre of Conservation Education which can facilitate and accommodate the various organizations in the field of environment and conservation education. Thus by delivering various environment education activities under one umbrella Central Zoo has proved itself being a living classroom for all age groups.

1-2

Focus On Rainforest • Eco-System Thinking

Emily C.C. Lin

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The United Nations General Assembly declared 2011 as the International Year of Forests to raise awareness on sustainable management, conservation and sustainable development of all types of forests. Indeed, forests are home to a number of threatened, endangered and sensitive species as well as plants, and meanwhile, forests also serve as the protector of our earth and water resources.

To celebrate “forests for people” during 2011, Taipei Zoo in the name of “Focus on Rainforest and Eco-System Thinking” has held a wide variety of activities to invite the visitors to draw more attention to the issue of forests. On March 12, the Tree Planting Day in Taiwan, we did “Used Book Exchange” at Education Center in Taipei Zoo and promoted the concept of “Bring a Book, Save a Tree.” On April 22, Earth Day, we invited people to make an Earth Day promise and to share how they are going to act on their love of earth. On May 22, the International Day for Biological Diversity, there were “Book Fair and Youth Action Forum.” And on June 5, World Environment Day, at Taipei Zoo we held the event called “Plant Trees to Reduce Carbon Emissions.” By so doing, we hope that we can stimulate people’s awareness of the environment and enhance political attention and public action.

森活、森命、森呼吸

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2011 年為聯合國國際森林年，森林不但是野生動植物的家，同時也是大地與水資源的保護者，感恩森林生態系服務對人類的貢獻。臺北市立動物園以「森活、森命、森呼吸」“**Focus On Rainforest • Eco-System Thinking**”為題，圍繞森林與野生動物保育的議題，邀請民眾參與系列活動，為默默服務的生態系致敬。

3 月 12 日植樹節「回收一本書交換一棵樹」二手書交換活動，做為森林年的萌芽議題；4 月 22 日地球日「及時行動勇於改變」愛地球承諾活動；5 月 22 日國際生物多樣性日——曬書節暨青少年行動論壇，進行「捐書換書少砍樹」實際行動，達到國際森林年的最高理想——愛森林少砍樹；6 月 5 日世界環境日舉辦「動物園植樹減碳——愛地球」體驗活動，帶動參與者對於小生命及環境的關心。我們期待透過教育活動改變對待周遭環境的態度，生活中落實改變的行動。

1-3

“Feel the Forest in the Zoo” Program – It's a New Style of Zoo Education

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Is it impossible for the visitors to “walk into” the forest in the zoo? The answer is “No”. The zoo world can make visitors feel like they are in a real forest. But you may wonder: “How is it possible?” It is very important for the keepers (educators) to try not to cram too much knowledge about the animals exhibited in the zoo onto the visitors, but also to make the visitors focus on the background – the animals’ life in the forest. The keepers and the educators can also tell the people that the forest and the sea affect their relationship each other and tell how important their bond is. “Feel the Forest in the Zoo” program is a new style of zoo education. The visitors listen to the keepers’ talks and focus on the future of the forest-sea relationship. The forest-sea relationship not only enriches the nature but also has the potential to diversify the human life.

1-4

Ecosystem Sustainability Surabaya Zoo as Forest City

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Indonesia has many tropical rain forests, located in the middle of the equator that allows the region

gets enough sunshine and high rainfall. From research in 2009 declared a tropical rain forest in Indonesia is one of the tropical rainforest of the most threatened on earth. Destruction of forests and the environment due to human factors as the main cause. With the increasing destruction of tropical rain forests, there is then a question coming across my mind: What can we do to save the beautiful rainforests?

One of them with the protection of forests and sensitive ecosystems is to increase the carrying capacity of ecosystems by enhancing the expansion of forest conservation and protected forest. The role of the zoo is very helpful for the sustainability of ecosystems.

Surabaya Zoo is one of the ex-situ conservation of forests and has an important role in the sustainability of ecosystems and in keeping the balance and relationship between living things and their environment. It also functions as an urban forest that has ecological benefits, namely the achievement of environmental compatibility between plants, animals and humans and as wildlife habitat, and protection of germplasm. Educational benefits, urban forests can serve as a living laboratory for the general public and school students as it can recognize the various types of trees, wildlife and migrant birds are often found in the region.

1-5

Biodiversity and Wildlife Education Programs of Wildlife First Aid Station, ESRI

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Wildlife First Aid Station of Endemic Species Research Institute (ESRI) is a governmental organization which provides equipment and facilities for emergency veterinary treatments to injured or sick wildlife. We found that the major cause of morbidity and mortality for the animals admitted is caused by human activities, such as traffic accidents or traps set up by hunters. It is then our obligation to draw the public attention to the importance of wildlife in order to maintain a harmonic relationship between humankind and wild animals. Since April 2007, we have been holding many education programs including wildlife educational ambassadors, puppet shows, dramas and ecological games. Those activities take place in the forms of lectures, festivals, or summer camps, in the ESRI or in other sites such as elementary schools or malls. Till June 2011, we have held 232 education activities, to which participated more than 10000 persons. According to surveys, the satisfaction of the participants in joining the education programs comes from the knowledge acquired and the interest for the different activities.

1-6

How are Orangutan and Our Life Connected? – Tropical Forests Fragmented Game for Primary School Children

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One of our keepers visited Borneo Forest with other keepers in Japan and built fire hose bridge to connect fragmented forest on April 2009. One Orangutan crossed the bridge on June 2010 for the first time. The primary reason why Orangutan's habitat is under threat is disorder deforestation for palm oil plantations which we Japanese import a large volume of oil to make daily necessities. However, most of the Japanese children don't know the influence of palm oil on Orangutan in the wild. We designed the education program based on three workshops for these children on August 2010. Children experienced in Orangutan's standpoint what would be happen when the forest was fragmented. Then they built fire hose bridge in a forest of our zoo as our keeper did and hung on the hose feel like Orangutan. Finally they went on a trip to make interviews to our zoo keepers who impersonated to various standpoints surrounding Orangutan. Children came to know the problem was not simple, but they understood that anything didn't change if nothing had done. The difference become large whether being possible to step forward, even it might be only one small step by each person.

Session 2

Moderator: **Jung-Tai Chao**, *Taiwan Forestry Research Institute*

2-1

2011 Year of the Bat Themed Events: “Month of the Bat Protection” of Nanjing Hongshan Forest Zoo

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In May 2011, according to the theme of international Year of the Bat, Nanjing Hongshan Forest Zoo held a series of “bat protection” themed events. The month-long program included both interactive activities inside the zoos (such as puppets play, handcrafts making, games and specimen display) and “Animal Lecture on Campus” in the primary school classrooms.

2-2

Learning in the Dark

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Kadoorie Farm and Botanic Garden (KFBG) is situated on the side of the mountain Kwun Yum Shan and comprises 148 hectares of forests and mixed habitats. It is home to over 1,800 animal species (including insects) and 1,500 plant species. Together with the beautiful landscape, it provides a perfect setting to connect visitors with nature. Since 2003, KFBG has been running an evening programme called the Night Safari. It is an educational guided tour that introduces visitors to the nocturnal world on our hillside and on the door step of one of the most crowded cities in the world. We encourage participants to open up their senses and become immersed in the sounds and smell of the night. This can be a special personal experience and by delivering messages connected to light pollution, climate change and species identification, we can add more serious elements to the overall learning experience. We are hoping that through the night safari, attendees will develop a better understanding and empathy toward the natural treasures that exist around us.

2-3

Fun Bats at Taipei Zoo

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Concerning about biodiversity conservation and natural science education, Taipei Zoo and Tainan National University of the Arts hosted a bat exhibition under the funding support from National Science Council to encourage general public to understand and protect bats. The exhibition, BATs = Biology + Arts + Technology, was designed with attractive exhibits, photos, specimens, bat molds and education activities to introduce bats' morphology, physiology, ecology and connection with culture. The highlights from this multi-disciplinary exhibition include: vampire bats, echolocation devices inspired by bats, interactive diorama explaining bat's nocturnal behavior, a replica of da Vinci's flying machine, and a cast of the earliest known bat fossil. After the successive run in the Taipei Zoo, the exhibition toured around Taiwan to attract more audiences.

The objective of this project is threefold: (1) promotion of natural science education, (2) conservation education of natural environment, and (3) encouragement of scientific understanding on bats. By interpreting knowledge and culture relevant to bats, it is expected that the public and schoolchildren will be encouraged to observe natural science around daily life and appreciate natural conservation.

2-4

Tree Climbing Education and Conservation

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There are many animal living in the trees of Hsinchu Zoo. Some are primates, birds, and reptiles, and their original habitats are in rainforests all over the world. We have a tree climbing program that shows visitors how to climb the trees in the zoo and to recognize which arboreal zoo animals spend more or less of their time on the high canopies or lower places. The Hsinchu Zoo collaborates with a local professional climbing team that provides teachers and equipment to guide visitors while climbing. The program occurs once every two months. We will alert the people by different kinds of media.

By the view from different parts of the tree, the climber can find some wild animals right beside them, such as ants, lizards or birds. Returning climbers can also understand that humans are the least skilled tree-climbers of all primates.

We also introduce what kinds of researchers use these climbing skills and equipment for searching biota or collecting specimens for conservative works. Some volunteers have climbed trees and built nesting places for birds and bats in the zoo for the aim of education and conservation. Therefore, choosing strong and suitable trees for climbing is important for security reasons.

2-5

Young Child Education in Ocean Park Summer School

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Ocean Park has been one of the proactive parties providing educational programmes in Hong

Kong. During the summer holiday, we have Summer School for children and youth to learn about the nature in a fun and happy way. There are 4 different levels of classes for children of different ages. In this presentation, our focus is on level 1 classes, with the theme as Little Explorer, which is suitable for 4 to 5 year-old children. During the 3 half-day programme, there are challenges in taking care of children with such a young age, such as getting children's attention, maintaining class order and delivering new and difficult terms. Through observation and experience, we have figured out a set of solutions and techniques to tackle with these challenges. And most importantly, with the help of these techniques, we are able to deliver the knowledge of the nature and also develop their correct attitudes towards the nature.

2-6

The Role of Fragrant Flowers in Forest and Smell in Taipei Zoo

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Plants and animals are interdependent. For instance, in order to reproduce their offsprings, the fragrant flowers need to make good use of their aroma to attract insects.

Arbors in the forest of Taiwan include *Acacia confusa* (Taiwan Acacia) and *Fraxinus formosana* Hayata (Formosan ash). And, though their flowers are quite inconspicuous and difficult for men to find, the strong smell of those small flowers during spring and summer will tempt insects.

Different kinds of fragrant flowers distribute their scents in different time. To avoid the conflicting schedule of disseminating their scents and to evade the possibility of mixing different floral scents as a whole, they will choose either day or night respectively by themselves to distribute their own smells.

Pollinating insects are also influenced by day or night. Since the pollinating insects cannot see very clearly in the night, the fragrant flowers then will spread more strong scents to seduce the insects. And interestingly, the insects attracted by some hydrophilic fragrant flowers during the night are also regarded as delicious meals of the frogs. At the same time, those frogs also attract many ophidians. Here we can clearly see a very exciting food chain.

Keeping the scents of fragrant flowers is a challenge. Scents are collected from local fragrant flowers in Taiwan and also used to produce special aroma oil. Taipei Zoo provides visitors with a new experience of olfaction in the summer and simultaneously attempts to convey the concept that the scents of fragrant flowers carry multiple meanings. They can represent food, food chain and reproduction.

2-7

Zoo On Air

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Taipei Zoo

Taipei Zoo accommodates over 450 species of animals, or 3,000 individuals, of which visitors are acquainted through reading the interpretive signs sited in the zoo. However, with each animal exhibiting different personality and habits, our keepers need to take care of them in an assortment of ways. The behind-the-sign stories between our animals and keepers are more interesting and touching than what is seen on the signs.

To share these valuable stories, therefore, we launched a radio show “Animal Bugle Taipei” (on air every Saturday 9:00-10:00 a.m.), hosted by Animal Papa, the Director of Taipei Zoo. Through the conversation between the keepers and the host, we expect to present the life stories in a friendly and vivid way. Moreover, we hope that our audience, especially children and teenagers in front of the radio, can ponder upon the issue of animal conservation and realize that conservation is not just a slogan. As the old saying goes “Actions Speak Louder than Words,” it is then our responsibility to do something for the conservation of wildlife.

Wednesday, September 21, 2011

Session 3

Moderator:

Jason S. C. Chin, *Taipei Zoo* and

Shan-Ning Zhang, *China Wildlife Conservation Association*

3-1

Zoolympix 2011 - In Celebration of International Year of Forest

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Learning about nature conservation should be fun, interactive, and engaging. Each year during the June school holidays, visitors to Singapore Zoo pit their skills and agility against the Olympians of the animal kingdom. As they have fun challenging fastest, strongest and sharpest, they learn more about the wild Olympians and the related conservation issues. This year, Zoolympix 2011

celebrated International Year of Forests and as participants journeyed through the six game stations, they get to know some special forest friends and took home tips to save the forests. With aggressive promotional and advertising efforts, Zoolympix 2011 attracted 7,400 participants. The event not only allowed Singapore Zoo to spread the forest conservation message but also provided a platform for 280 student volunteers to be wildlife conservation ambassadors and to gain social experience.

3-2

Practice and Exploration of Non-governmental Academic Institutions to Carry out Giant Panda Conservation Knowledge Education

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Seminar on the Eco-environment and Culture of Giant Pandas of Sichuan Province

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The research was aimed at discussing the ideas and methods of non-governmental academic institutions to carry out Giant panda conservation knowledge education. Sichuan Giant panda ecological and cultural research association was referred to as an example to discuss how non-governmental academic institutions to bring social forces together , hold summit forums, make good use of social platform and civil forces, use the network media, focus on the demands of public and then promote the propaganda and education of giant panda conservation knowledge.

民間學術機構開展大熊貓保護知識教育的實踐與探索

羅光澤

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本研究旨在探討民間學術機構開展大熊貓保護知識教育的的思路與方式方法，並以四川大熊貓生態與文化研究會做實證研究，探討民間學術機構如何彙集社會力量，舉辦高峰論壇，巧借社會平臺，發揮民間作用，利用網路媒體，關注民眾需求，促進大熊貓保護知識的宣傳教育。

3-3

Report and Sharing on Education and Guest Experience at Giant Panda Adventure

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Since the opening of “Amazing Asian Animals – Giant Panda Adventure” in 2009, Ocean Park has been promoting environmental and conservation education through exhibition and education activities. This report shares what has been achieved, and the process of how we continuously improve these two aspects. This experience, including conducting exhibit survey, and introducing more variety and thematic interpretive elements, was an invaluable learning for us and for sharing with our fellows.

《大熊貓之旅》教育及遊客體驗報告經驗分享

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自二零零九年大熊貓之旅開幕以來，《亞洲動物天地——大熊貓之旅》展館及教育活動一直深受遊客歡迎，本簡報會簡述這兩方面的工作。而海洋公園亦一直不斷提昇遊客體驗，包括進行遊客體驗調查，並於展館及教育講解中引入更豐富的教育及保育內容。當中有成功經驗、亦有從失敗中學習的過程，包括在教育講解中引入主題式戲劇講解的個案。本演說希望向同業交流及分享箇中經驗及學習。

3-4

Making Good Use of Main Attraction to Intensify a Zoo’s Educational Function

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A longstanding concern of zoo educators is how zoos make good use of their main attractions to promote conservation, to lead the public to better understand the problems wild animals face in their constant battle for survival, to take action to protect animals, and to help maintain the biodiversity. Taipei Zoo has exhibited the giant panda (*Ailuropoda melanoleuca*) since January 26, 2009. The giant panda is undoubtedly a main attraction of Taipei Zoo, with 6,405,467 visitors by June 30, 2011 and making up 84.5% of all visitors within the two and the half year period. With the opening of the giant panda exhibit, Taipei Zoo has designed a comprehensive exposition dedicated to the exhibit, and trained volunteers to provide visitors with the latest ecological information on giant pandas.

During the summer of 2011, Taipei Zoo held a series of workshops named “The Black and White Bear Meeting.” In association with exhibits of the zoo’s two main attractions, the giant panda and The Formosan black bear, were lectures, animal handling by zoo keepers, and art and handicraft activities for visitors. The aims of the workshops are to help participants realize why wild animals

have become endangered species, and to let participants to take the responsibility to save them. Follow-up assessment indicated that the exposition met the main goal of zoo education, with more than 60% of the workshop participants showed significantly increased awareness about the dangers animals faced.

善用動物明星強化動物園的教育功能

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長久以來，動物園教育者關切的是，動物園是否善用其所擁有的動物明星精確地傳達保育的觀念，讓人們瞭解野生動物所面臨的問題，進而抱持「願為維繫生物多樣性而採取行動」的信念。臺北動物園自 2009 年 1 月 26 日開放大貓熊(*Ailuropoda melanoleuca*)展示，截至 2011 年 6 月 30 日止，累計已有 6,405,467 人次入館參觀，占總入園人數之 84.5%，大貓熊扮演明星的角色無庸置疑。大貓熊館早在開放之初即建置完整的解說系統，並透過培訓解說志工，提供遊客接受解說服務，2011 年暑假更進一步舉辦「黑白雙熊會」研習活動，以全民熟知的大貓熊和臺灣黑熊為主角，透過課堂講授、動物管理員示範解說及美勞創作活動，使學員體認野生動物瀕危的原因，認同人類保護瀕危動物的責任。由該活動之評量結果得知，超過 60%的學員自認為參加課程之後，對於瀕危動物之相關議題的瞭解都大有增進，這正是動物園教育最重要的目的。

3-5

Starting from the Head of the River: Thematic Conservation Education in Endangered Wild Animal Rescue Center

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The main function of Pingtung Rescue Center for Endangered Wild Animals (PTRC) is to give proper care, medical treatment, and health maintenance to endangered animals that are injured, abandoned by their owners or confiscated by government. Except direct service and immediate relief for endangered wild animals, PTRC also provide 1.5 hour guided touring service to the public since 1998. However, most people still have had insignificant concern on ubiquitous conservation-related issues, leading enormous rescued wildlife derived from illegal use and trade. Starting in 2010, PTRC developed thematic conservation education modules to educate public about conservation issues. The modules include “inside center modules” and “outreach modules.” Inside center modules were designed for visitors who want to spend 3 hours or more in rescue

center, while outreach modules were designed for G1-9 school students and teachers, and will be implement at schools. All modules will not only highly enhance the learning opportunities of enhancing conservation science for G1-9 students and the general public, but it will also help to construct a sustainable education network of conservation biology and wildlife science. It will also help to fulfill the ultimate goal of the PTRC, which will increase people's understanding and appreciation about nature and conservation science, and to arouse their concern for life, and change their attitude and behavior in protecting our environment.

Session 4

Moderator: **May Lok**, *Wildlife Reserves Singapore*

4-1

Together we are stronger! Human Resources Strategies for Zoo Education

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Manpower is one of the most sacred resources for zoo education. A group of passionate and energetic educators could have a big impact on audience when delivering conservation messages. Here is Ocean Park, we have implement different trainings and projects to better equipt our educators. This is to keep up their passion, fine-tuning their skills, and create exposure for them to match with different trends in zoo and conservation education.

The human resources market in Hong Kong has been competitive and non-government organizations fight hard to recruit sufficient headcount to maintain their operation. We also have special ways in recruiting the right person to join us, and to explore potential youngster who will be devoted to make a different for the earth. This presentation is to share our experience in managing human resources effectively in zoo education.

4-2

Learning Experiences of School Pupils through a Hands-on Exhibition: A Case Study of the Travelling Exhibition - "Biodiversity 911"

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This study utilized the “Biodiversity 911: A traveling exhibition” designed by Society of Wildlife and Nature (SWAN), and displayed in the National Science and Technology Museum from July 2008 to October 2008 as the site for investigation. School pupils’ learning experiences from visiting the exhibit were assessed. “Learning experiences” measured in this study are defined as a combination of three factors including affective, cognitive, and behavioral tendencies. Results of the study revealed that the children’s performance of involvement in the hands-on exhibition, “hands-on” indeed was the activity most children like. Conversely, “taking notes” was the activities unwelcome to the children. In addition, learning experiences perceived by the school pupils regarding to the exhibit showed the factors of “affective” and “behavioral tendencies” were significantly stronger than the factor of “cognitive”. Suggestions for the practices and future research were further discussed.

4-3

Teacher Training Programme on Human Elephant Coexistence HECX

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Zoo Outreach Organization with the support from US Fish and Wildlife Service conducted 14 teacher training programmes in India, Bangladesh, Nepal, Bhutan and Sumatra (Indonesia) from 2008 to 2011. Total of 14 training workshops were conducted and trained 433 teacher’s trainers and 21 intern trainees. These trainees belong to 256 institutions. The objective of the project is to make educators to change their attitude towards problem elephants and try to coexist with them.

According to the major objective of the project, we trained educators from five elephant conflict countries by using a wide variety of dynamic, innovative and exciting techniques in teaching about elephant conflict prevention and mitigation that at the same time coexist with them. The workshop also taught them the important daily practices that they have to follow in the elephant range areas such as “dos and don’ts” in the elephant conflict areas. The active teaching methodology also helped them to increase their confidence level in teaching a new way to teach about human elephant coexistence. They also learned to use tools such as drama, games, academic activities, maps, history, politics, personalities, stories, debates, demonstrations, arts, mock conferences and evaluations to convey pertinent information which would alter attitudes and behaviour of their own and whoever they teach with this active learning tools.

4-4

Bring Back the Endangered Yellow Birdwings

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Penang Butterfly Farm

Butterflies are among the most loveable creature in our planet. They pollinate our plants and act as the indicator of a green, healthy environment. Many do not realize how excessive removal of wild plants can cause a disaster for butterflies. Caterpillars eat only some very specific plants as their food and, also, because deforestation is clearing off space for many species of wild plants, butterflies are losing their food plant. As a result, the number of local butterfly species around the world is declining. As zoo educators, it is our task to alert young generations about this matter and guide them to be involved in the conservation of butterflies. As part of this effort, Penang Butterfly Farm has launched a conservation project named “Bring Back the Endangered Yellow Birdwings.” Selected schools in Penang were sponsored with an enclosed butterfly garden furnished with butterfly food plants and nectar plants. A workshop was designed to train and expose students and school educators to the standard procedure of breeding butterflies, covering ways of handling and troubleshooting every stages of the butterfly life cycle, preparing them to breed and release butterflies in their own school. We hope that through this project we can draw in more young people to be aware and involved in the conservation of butterflies.

Thursday, September 22, 2011

Session 5

Moderator: **Tzu-Chau Chang**,

Graduate Institute of Environmental Education, National Taiwan Normal University

5-1

The Penguin Walk; Visitor’s Perceptions and Interests of Penguins

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Asahiyama Zoo

Most Japanese people think penguins are “Kawaii” which means cute in Japanese, and that is also why they love them so much. However, many Japanese people also received lots of incorrect information about penguins. For example, penguins are misunderstood as living creatures inhabiting only in Antarctica. In addition to people's ignorance of penguins, they show little interest in the ecological and environmental issues in relation to wild penguins. Asahiyama Zoo has been holding The Penguin Walk during winter since 2002. The Penguin Walk is an event where the visitors can see the penguins walking around the zoo, but it is not an animal trick show. It reproduces a wild behavior of king penguins which walk to go hunting in the sea. It doesn’t only exhibit the figure but also explains about them. In this study, the visitors were surveyed about their

perceptions and interests of penguins by a questionnaire. Furthermore, the results made a comparison of visitors who had heard an explanation about penguins, and those who had not. As a result, the visitors had a favorable impression about penguins regardless of the explanation. On the other hand, the explanation was influenced on their image and interest of penguins. The visitor who heard the explanation viewed The Penguin Walk as a wild behavior and their interest shifted to the ecological and environmental issues of wild penguins.

5-2

Volunteer Work - a Great Opportunity to Educate Companies

Carl Leong

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In the past, companies usually built their reputation through marketing and advertising strategies. Nowadays, they shift their focus to social responsibility. Many big companies and enterprises have established their own volunteering teams. They encourage and support their staff to participate in volunteer work like elderly home visits and underprivileged family care. With raising awareness on corporate sustainability, some companies extend their volunteer efforts to environment-related work, such as tree planting and beach cleaning.

This presentation shows how Ocean Park Hong Kong works with a green group and a banking corporation to provide volunteer work opportunities to 500 staff in a 15-month survey project. This volunteer project is characterized by collecting survey results that benefit all three parties and its high feasibility no matter what facilities and animals you have. At the same time, it provides golden chances for educating businessman who maybe the decision makers of his/her companies, leading to “Eco-System Thinking” and practices of the companies.

5-3

Learning in Games: the Taipei Frog *Hylarana taipehensis* Conservation and Education Promotion as an Example

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Taipei Zoo

Co-authors:

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Hwa-Ching Lin, *Forestry Bureau, Council of Agriculture Executive Yuan*

The Taipei frog (*Hylarana taipehensis*) is small in size with an adult female measuring roughly 4 cm in length, and a male about 3 cm. The body is slim, with a bright green or yellowish green back

and two obvious white-golden lines on both sides. In the past, they were distributed widely in low-altitude freshwater wetlands of Western Taiwan, such as swamps, pools, paddy fields and canals, which was also the areas of human activities. Over the past ten years, they have become a threatened species in Taiwan because of wetland loss, fragmentation, the excessive use of agrochemicals on farmland and fallowed paddy fields. Nowadays, the species can only be found in New Taipei and Tainan Cities, Taoyuan and Pingtung Counties. Since 1999, the Taipei Zoo has been started Taipei Frog Conservation Program, including population survey in the field, habitats reservation and improvement, and wetlands restoration. Meanwhile, we cooperated with local community, schools and NGOs to carry out habitat-improvement and hold organic agriculture education workshops. In order to extend the education incidence, we held a lot of activities to stress the importance of conservation. Playing games is one of the best activities that the general public can learn easily about conservation of the Taipei frog. We designed three kinds of games, Frog Jigsaw Puzzle, Take Them Home and Frog Millionaire School, and instilled the knowledge and the idea of conservation of the Taipei frog and wetland ecosystem. 1).Frog Jigsaw Puzzle: Player formed a Taipei frog picture and learned the morphology of the Taipei frog when fitted pieces together. 2).Take Them Home: We used the pictures of wetland creatures to introduce the Taipei frog and the sympatric species and emphasize the values and functions of wetland ecosystem. The players realized the relationships among different species by putting the pictures on the right habitats. 3). Frog Millionaire School: We imitated the popular and famous TV program of Taiwan, Millionaire Elementary School, and designed several types of questions about the Taipei frog, including geography, history, life, language, mathematics, music, sport, and biology. Players had to turn the circle plate and answered the question which the indicator pointed out. During the playing process, players could look for help from others with different ways and gave the host their answers. In addition to using the games to promote the education and conservation of the Taipei frog, we integrated the conservation ideas with school courses and shared our game designs with teachers. We expected that the Taipei frog conservation action plan which started from the Taipei Zoo could be popularized to everywhere in Taiwan. Through the promotion programs, we hoped people can comprehend the importance of preservation of the frogs and habitats and encouraged them to participate the conservation action, and then we can extend our conservation power and keep the Taipei frog alive in Taiwan in the future.

5-4

S is for Snail

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Taipei Zoological Foundation

Co-author: Bo-Chuan Hsieh

Most of the visitors come to zoos to see big, beautiful and eye-catching animals while those dark, slimy, tiny little animals are ignored. However, part of zoos' duties are environmental and conservation education; it is quite important to give general public the ideas of community, ecosystem and biodiversity and not only to emphasize those star species such as giant pandas and king penguins.

There are more than 280 species of land snails and over 70% of them are endemic species. However, most of people can only recognize the invasive giant African snail (*Achatina fulica*), but usually ignore other mollusks they will encounter almost in their daily life. That is why we need to encourage people to observe, to learn, to care, to see those small animals around us.

We have held a series of snail education activities, such as snail exhibitions, snail cosplay crawling contests, snail monopoly and snail booklets in the past 6 years. Our education programs visited more than 100 elementary schools in Taiwan to conduct those activities and promote public understanding about land snails and biodiversity. We wish our efforts can arouse the public awareness on wildlife conservation, and facilitate the effort in taking care of endemic species, reducing illegal wildlife smuggling and releasing exotic species.

5-5

To Be or Not to Be is Not a Problem - The Way to Take a Photo in an Aquarium

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Taking a photo of living organisms is commonly found in an aquarium. It is the best way for tourists to share the wonderful visiting experiences with others. The flash light of camera is usually automatically turned on under the low light intensity conditions. Marine organisms such as fishes are always shocked unexpectedly by the countless flash lights from cameras and, more importantly, photographing with flash usually increases mortality rate of marine organisms. However, prohibiting tourists to take photos of living organisms usually results in the conflicts between tourists and on-site tourist guides. To solve these conflicts and to meet the needs of tourists, here we compared and contrast different kinds of responses to tourists both from the restriction-rule poster and the suggestion-rule poster on photo taking. As a result, we found that tourists were more interested in reading the suggestion-rule poster than the restriction-rule one. Our research also showed that only few tourists were attracted to the restriction-rule poster even they were both set in front of the entrance of exhibition hall. After reading rules on the suggestion-rule poster, most of tourists were more willing to turn off flash light before taking a photo than those who read the restriction-rule poster.

Poster Abstracts

Wednesday, September 21, 2011

01

Zoo Education: A Comparative International Study of Zoo Intentions and the Visitor Experience

Katie Roe

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This empirical research project aims to explore zoo education and understand the relationships between the description of education missions, the implementation of education programs, or mediums, and the impact of educational messages on zoo visitors.

02

Use of Drama Elements to Help City Children Understand Rainforest

Jane Ng

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Drama elements like collective drawing, still-image, thought-tracking, ceremony, teacher-in-role and so on are some common drama-in-education formats. They touch the mind of participants/audience and excite active thinking and reflection.

In this poster, experience of using different drama elements to teach children from the age of 8-15 about rainforest will be shared. Due to geographical difference, for a lot of Hong Kong people, rainforest is merely a term that they read from books, heard from news and watched on TV. Drama elements and formats could be a good way to help them understand rainforest, from the animal species, to the native culture and some complicated environment issues.

03

Seoul Zoo's Efforts for Raising Public Awareness of Wildlife Conservation

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Seoul Zoo, Seoul Grand Park

Seoul Zoo campaigned on many various programs for increasing public recognition of wildlife conservation. These Seoul Zoo's efforts is to save wildlife and the environment from global warming and environmental destruction. WAZA (World Association of Zoos and Aquariums) and IUCN (the International Union for Conservation of Nature) have named 2008 the Year of the Frog in order to raise public awareness and address the issue. The Seoul Zoo also held “Frog's Big Stink at Zoo” event for the global campaigns on the protection of endangered animals.

In 2009, “Save the Gorilla” program is the best wildlife conservation program of Seoul Zoo’s efforts for raising public awareness with the opening of Ape Jungle in 2009. On July 2011, Seoul Zoo launched the “Rescue the elephant” campaign program to help save the lives of elephant in the rainforests of Africa and Asia.

Additionally, the Seoul Zoo provided education programs for protecting the Korean traditional common seal, tiger and rabbit so on.

04

Educational Programs with Experts from Various Fields on Animals and Plants at Seoul Zoo

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Seoul Zoo, Seoul Grand Park

Seoul Zoo offers passionate education programs of animals, insects, and plants that these programs are grouped by different subjects and grade levels. Zoo informs wildlife and environmental conservation through the unique experiencing and education programs for annually more than 70 thousand people who are all people such as kindergarten children to adults and disabled.

Zookeepers, veterinarians, researchers, curators, embalmers and plant experts participate as teachers and trained volunteers as animal guides. People experience and experiment at animal hospital, feed room, artificial nursing room, research room, insectarium and botanical garden.

Programs designed for the important for conservation of forest and ecosystem with using snack’s skin, and dead animals' furs, bones and faecal matters because people cannot touch and feed wildlife.

In the future, the Seoul Zoo provides living experiencing place as a zoo and tries to contribute for conservation wildlife species and environmental education.

The Important of Environmental Conservation with Zoo Camp and Guided Tour Programs

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Seoul Zoo, Seoul Grand Park

The Seoul Zoo presents a variety of zoo education programs about diverse topics and different kinds for visitors. The programs effectively educate the important for the conservation of forest ecosystems and biological diversity in various and different ways for visitors. Seoul Zoo has significant educational effects because Seoul Zoo offers visitors a break from the smelting heat through Seoul Zoo's summer nocturne festival and extends its opening hours until 10 p.m. every night in the period.

The popular programs are a special guided tour at night and a unique family overnight opportunity which is you sleep in tents in a field for one-night and two-days. “Night Zoo Expedition” program started with Seoul Zoo Nocturne Festival in 2006. The program provides interesting wild animal's ecological story and experience tiger's skulls, bird feathers and anaconda's skin.

“Camping at the zoo” began in 2008 from zookeepers spontaneously. Having declared 2009 as the Year of Visiting the Seoul Zoo, Seoul Zoo projected the zoo camp program in celebration of the 100th anniversary of the Korean Zoo History.

Conservation Activities of an Endangered Wetland Insect, the Giant Water Bug (*Lethocerus deyrollei*: Belostomatidae, Hemiptera), in Korea

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Seoul Zoo, Seoul Grand Park

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The giant water bug (*Lethocerus deyrollei*) is primarily distributed in lowland wetlands, such as ponds, pools, and irrigational channels of rice fields, but the population has drastically decreased for last a few decades in the Korean Peninsula. This species was listed as an “endangered wildlife species” in 1998 and has been legally protected by the Ministry of Environment of Korea.

This study was conducted in the Gyodong Island in Gyeonggi-do, Korea. In 2006, more than 500 individuals were attracted by light in the study area. Until late August 2007, however, the number considerably decreased to 170 individuals probably because of habitat destruction such as irrigational channel construction around the study area during spring of 2007. In addition, the

attracted individuals were unable to survive because of dehydration and predation by birds and rodents. Our field studies demonstrated that not only light attracting behavior of *L. deyrollei* but also habitat destructions have caused a local extinction of the species.

07

Introducing Education Programs for Wildlife Conservation at the Seoul Zoo

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Seoul Zoo, Seoul Grand Park

Seoul Grand Park is a park complex to the south of Seoul. The park consists of Seoul Zoo, Seoul Land Amusement Park, National Museum of Contemporary Art, and Rose Garden etc. The zoo part of the park covers 598 acres. In fact, Seoul Zoo has 2,736 animals from 311 different species including mammals, birds, reptiles, amphibians and invertebrates. The Zoo is home to thousands of animals and plants from all over the world. Seoul Zoo is dedicated to preserving and protecting rare and endangered wildlife and habitats.

The Education Department's mission at the Seoul Zoo is to increase the knowledge and appreciation of animals and plants in people of all ages through a wide variety of educational programs and services. The Seoul Zoo believes that successful conservation begins with education. The Seoul Zoo offers a fantastic educational experience. Situated in the front of the Zoo, the Education Center is staffed by experienced, professional zoo educators and provides various conservation programs for learners all through the year.

08

Firefly Conservation and Ecotourism: Evaluation of Artificial Habitat Construction for an Aquatic Firefly, *Luciola ficta* and Population Monitoring in the Ecological Education Park

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An aquatic firefly, *Luciola ficta* was common and distributed with paddy field at western plain of Taiwan. Their habitats commonly located in the small irrigation ditches, fresh water wetland and paddy. Flashing adults were popular occurrence at 40 years ago. Now it is hard to find in their habitats. For conservation consideration, preservation techniques of the artificial breeding have improved for better resource stocking. In order to recovery the *L. ficta* population in the field, we

tried to construct the habitat in the wild for watching the firefly flashing again. First, we conducted the restoring larvae, vegetation engineering, treatment of bottom substrates, releasing larvae prays as native water snails and shells, and assessment of probability of the larvae releasing. Thereafter, we held the releasing activities and the stocking larvae were introduced in the artificial habitats. The flashing adults were monitored from March to August yearly. As an example of recovery of *L. ficta* by artificial habitat construction in Ecological Education Park at Taiwan Endemic Species Research Institute since 1997, steady population fluctuated until 2011. The model of the artificial habitat construction for *L. ficta* was suggested and key to the better environmental education as well as the new characters for ecotourism in Taiwan.

09

The Combination of Taiwan Lantern Festival and Ocean Environment Education - Case Study

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Farglory Ocean Park

During Feb. 17th to 28th in 2011, the team of Farglory Ocean Park exhibited a 13 meter-width discriminated lantern, which symbolized the company's spirits. Through the vivid moon jellyfish (*Aurelia aurita*) and the artificial jellyfish (plastic bag), they can leave public to pay more attention to our environment.

10

Exploring the Biodiversity of Youths by Zoo Education Program

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Biological diversity indicates the variety of life on earth and the natural patterns it forms. Biodiversity also provides a large number of goods and services that sustain our lives. These natural services are so varied as to be almost infinite. Besides, it also connects with our culture, beauty, science, economic, education and ecological value closely. Because of losing the biodiversity, taking actions for biodiversity is the most important thing in the nowadays. In order to inspire the youth to understand the importance of biodiversity, there were two different kinds programs designed for high school and university students by the materials of the zoo. The

objectives of these programs were not only motivated youths to take action to safeguard biodiversity, but also help them to discover the amazing connections between themselves and biodiversity. Further to explore the science and technology about biodiversity. After these programs we found both of them can achieve better learning progress and application about the biodiversity. These programs also inspire young people to do something for the conservation of biodiversity.

11

Discover the Five Poisonous Animals in Taipei Zoo

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Duanwu Festival, also known as Dragon Boat Festival, is an important holiday in the Chinese traditional culture. In Taiwan, the main folk activities of the Duanwu Festival are making sachets, eating rice dumpling (zongzi) and racing dragon boats. Besides, “Ward off the five poisonous animals” is the most specious. In order to celebrate the Duanwu Festival, Taipei Zoo holds a small exhibition about the five poisonous animals these two years. In this exhibition, we display these animals such as venomous snakes, scorpions, spiders, centipedes, toads, and geckos which are often wrongly misunderstood as poisonous. The public learned more about these poisonous animals, and understood how to coexist peacefully with them through the keeper’s talk and living animal display.

12

The Design of Zodiac Animal Exhibitions at Taipei Zoo

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Zodiac animals are known in Asia. To introduce zodiac animals to the public is suitable and necessary. Zodiac animal Exhibitions were held annually at Taipei Zoo in the Chinese Lunar Year. These exhibitions include the topics of biology, morphology, physiology, relationships with human and conservation of these zodiac animals. To increase the learning interest of tourists, we use the commentary materials such as specimens, movies, computer games, interactive facilities and handcrafts. Tourists can observe the zodiac animals in the animal display areas after visiting our animal exhibitions. According to the result of questionnaire analysis, over 90% of tourists are

satisfied with our animal exhibitions, they also got more knowledge about these zodiac animals through these exhibitions.

13

The Challenge for Squirrels - Learning the Meaning of Life Through Games

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Taipei Zoo

There are many survival challenges in life stages of wild lives. In order to lead the public to experience the difficulties and possibilities during the lifetime of animals, Taipei Zoo is planning a life education project. In this project, we design a series of teaching materials such as learning sheets, interactive facilities and computer games, and those materials can be used in various education activities. In the summer of 2010, Taipei Zoo held an activity, “The Challenge for Squirrels.” The activity included four life stages of squirrels, which are feeding, activities, nest and reproduction. There were about 800 participants joining this activity. By passing through the challenges, they all learned the meaning of life and began to respect wild lives.

松鼠生存大挑戰——從遊戲中認識生命教育

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臺北市立動物園

臺北動物園在 2010 年夏天舉辦一場「松鼠生存大考驗——從遊戲中認識生命教育」活動，以松鼠為主角，設計松鼠生活史中有關覓食、活動、築巢、繁殖和死亡有關的挑戰活動，這個活動共有 800 人參加，參加的民眾都從遊戲中學習生命的意義和如何尊重動物。

14

Cultural & Creative Industries of Taipei Zoo

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The perspective of 21st century for Taipei Zoo is to become a modern zoo who practices conservation education as duty. The zoo makes a lot of efforts to promote with conservation research which is known as the function of modern Ark. Therefore, the zoo need to play an active

role who try to make its audiences, visitors, involved in supporting and participating conservation campaigns, in stead of entertaining the public by the past impression as a collector who showed exotic animals in the last decades. To set the zoo's brand, image and issue is a very important challenge for the zoo to attract audience's attention. The zoo needs to differentiate its unique market position and make market segment in a society full of popular entertainment. The message, content, and design about wildlife conservation should be delivered in multi-media, so called texture, which contains books, brochures, magazines, images, films, radio, music etc. and other publication form for customer relationship management, CRM. That's why Taipei Zoo needs to develop multi-textures to construct and strengthen its unique social education impression for reaching different target audiences. Therefore, Taipei Zoo inputs with a lot of artists, those cultural and creative industry workers' ideas and outputs with lots appropriated texture to attract public attention. Those textures are provided interesting ways as knowledge sources of wildlife conservation for the zoo's audiences. And these multiple textures are also as zoo's materials and kits for free choice of learning and non-formal education.

臺北動物園的文化創意產業

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21 世紀的動物園展望，是一個以保育教育為職志的現代動物園。在企圖突破過去幾十年來以珍禽異獸、嘩眾取寵吸引大眾目光的收集形象後，即便搖著以保育研究為旗幟，號稱現代方舟的動物園，仍不免必須在通俗的大眾休閒娛樂中競爭，以區隔出其獨特的市場定位。其中，以野生動物保育為主題內容的多元文本（text），包含書籍、折頁、影像、雜誌、影片、廣播、歌曲等出版品產製，用以建構與強化臺北動物園獨具的社會教育形象者，是臺北動物園有別一般大眾娛樂場域相當重要的一項作為。因應不同族群的目標對象和產生內容物的文本型態，往往需要仰賴與大量文化創意產業的工作者合作，以符合時代、產出合宜的說服文本，成為可獲取大眾注意與提供動物保育知識的來源。同時，多元文本呈現出的動物保育主題，也可成為由動物園有趣、創意的自由學習和非正規教育的教材輔具。

15

What role do you play? – “Working at Zoo” in Taipei Zoo

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The new growing demand of educational programs design nowadays is inclined to stress on practice and interactive activities. The effect of educational programs are strengthened by the approaches of “experience, explore, touching and inspiration”. Since the demand has risen steadily, Taipei Zoo planned the large scale educational programs in 2010 - “Working at Zoo.” This is a series of occupational cosplay games of zoo workers. Through the educational activities, the target audience will know the zoo is dimensional. Additionally, the visitors will learn the basic knowledge and awareness of how to make friendly with animals and environment. We even expect visitors have a better understanding to jobs.

The 9 occupations in Zoo are chosen. The visitors can play a role of one of 9 zoo workers during a 20-30 minutes educational program. The subjects of 9 activities are as follows: “May I Help You? – I am a Little Booking Clerk”, “Gorilla Lights a lamp – I am an Electrical Engineer”, “Let’s Dance! – I am an Animal Theater Actor (Actress)”, “Animal Papa – I am Zoo Director”, “Green Fingers – I am a Gardener”, “Little Fabre – I am an Entomologist”, “Can You Extract a Tooth from a Tiger? – I am a Zoo Vet”, “Go exploring! – I am a Nature Explorer” and “Animal Mammy – I am a Zoo Keeper”.

你扮演哪一個角色？——臺北動物園「開心動物園」教育活動介紹

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教育活動設計之世界新趨勢為互動式體驗型活動，藉由「體驗」、「探索」、「感動」、「啟發」之連鎖效應，提升活動之深度與教育效應，因應此趨勢，臺北市立動物園特於 2010 年籌劃大規模創新體驗型活動「開心動物園 working @ zoo」，期能透過探索動物園工作內容——角色扮演，及活動設計——呈現動物園多元性風貌，讓目標群眾（target audience）至動物園參與一般動物生態課程外，還可以建立選擇工作及事業的正確觀念。本園選擇出於動物園中相關職業並設計出教案於主題場館執行，各場館名稱及工作職掌分別為「小小售票員」（現場遊客服務）、「動物小保母」（動物管理員）、「小小綠手指」（園藝工作者）、「虎口拔牙」（動物醫師）、「動物劇場」（動物布偶表演者）、「猩猩點燈」（機電工程師）、「野外探險家」（野外研究人員）、「小小法布爾」（昆蟲飼養員）及「我是小園長」（動物園園長）等 9 種職業。

16

Program Design for Experience-based Zoo Educational Activities: Using Shoushan Zoo as an Example

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Shoushan Zoo

In recent years, Shoushan Zoo has been focusing its wildlife education and outreach program on interactive and experience-based themes. Examples include zookeeper's daily work practices, face-to-face animal encounters and hands-on props-making activities designed to introduce schoolchildren to unique animal behaviors. The purpose of these dynamic, experienced-based programs is to provide students with an understanding of different animal lifestyles and to introduce them to the concept of conservation in a pleasurable and relaxed setting. In the future, the zoo will continue its development of experienced-based education outreach programs to bring zoo conservation work to the public.

Keynote Speech Abstracts

Monday, September 19, 2011

Keynote Speech 1

1

Yes we can! Zoo Education as a catalyst for behaviour change.

Stephen McKeown

Chester Zoo

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Wednesday, September 21, 2011

Keynote Speech 2 & 3

2

The Impact of Pro-release Training on Giant Panda Infant Growth and Development

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The China Conservation and Research Center for the Giant Panda (CCRCGP) began the reintroduction program for captive panda infants in July of 2010. The first step in the process was to select 4 pregnant female giant pandas of breeding age that had been exposed to the wild prior to being brought to captivity. The four females were brought to Wolong Nature Reserve's Hetaoping Reintroduction Research Station. The female panda "Cao Cao" gave birth to a male infant weighing 205 grams on 8/3/2010 at the station. Over the course of his life thus far, the male panda has lived in a semi-wild environment and his growth and development have appeared normal. At the age of 6 months he weighed 11,600 grams, which is notably heavier than other pandas held in captivity. From November 2010 to January 2011, the activity of the mother panda followed a regular pattern. Her activity peaks occurred from 9:00-10:00 and 15:00-18:00 each day, with a smaller peak occurring at 24:00-2:00. Her resting periods occurred from 5:00-7:00, 11:00-13:00, and 20:00-22:00. We describe our pioneering method for human disguise and avoidance in order to prevent the infant from being influenced by humans and becoming dependent on human care. We put forth preliminary recommendations for care of infants involved in reintroduction programs from birth to six months. We also discuss the implications of our findings with regard to methods that may increase the vitality of infants born in captivity. We put forth a description of Cao Cao's response to her first exposure to a man-made representation of a masked civet and provide a rare video clip of her attacking behavior toward the experimentally introduced predator, which demonstrates the panda's innate self-defense mechanism.

野化培訓對大熊貓幼仔生長發育的影響

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中國保護大熊貓研究中心於 2010 年 7 月在臥龍開始母獸帶仔野外培訓研究。第一階段選擇 4 只具有野外生活經歷的雌性大熊貓到臥龍自然保護區核桃坪野化培訓基地產仔。大熊貓「草草」於 2010 年 8 月 3 日在培訓基地產一雄性幼仔，體重 205g。幼仔一直生活在半野化環境中，半歲時體重達到 11,600g，身體發育正常，較其它同齡圈養大熊貓幼仔相比警覺性更高、運動和攀爬能力較強。在 2010 年 11 月至 2011 年 1 月，母獸的活動呈現出明顯的規律性，即每天 9:00-10:00 和 15:00-18:00 處於活動高峰，24:00-2:00 有一個次高峰，而每天 5:00-7:00，11:00-13:00 和 20:00-22:00 處於活動低谷。本研究首創了大熊貓幼仔與研究者的偽裝隔離方法，避免了培訓個體對人和人工飼養環境的依賴。初步建立了大熊貓初生幼仔到半歲幼獸的野化培訓方法。探索了提高圈養大熊貓活力的新方法。首次記錄到「草草」對果子狸的反應，收集到罕見的大熊貓追擊果子狸錄影，證明了大熊貓的較強的自衛還擊能力。

Maintenance of Oral Health for Giant Panda – Experience of Oral Health Examination from Yuan Yuan

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大貓熊之口腔保健 - 圓圓口腔健檢經驗談

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大貓熊是中國大陸特有之旗艦級保育類動物，對臺灣地區來說，飼養大貓熊是全新的經驗與挑戰。爲了照顧遠渡來臺的大貓熊團團與圓圓，有必要對其身體狀況作一全面性的檢查與了解，並針對其健康問題擬定保健計劃。大貓熊的健檢過去在中國已累積豐富的經驗，唯口腔檢查與保健的相關資訊仍相對缺乏。因此臺北市立動物園與臺灣大學牙醫專業學院合作，於 2009 年 2 月 16 日，在全身麻醉狀態下，針對大貓熊圓圓施行來臺的第一次口腔檢查。

參與的臺灣大學牙醫專業學院在林俊彬院長的領導之下，相關的工作人員包括牙科醫師、牙科放射線師、牙科技師等共計 8 位。相關檢查設備包括牙科檢查器械、開口器、超音波洗牙機、針對大貓熊特別訂做之客製化印模牙托(以臺灣黑熊的齒列做範本)、印模材、可攜式牙科治療推車、可動式牙科 X 光機等。檢查項目包括大貓熊之口腔黏膜狀態、牙齒疾病、咬合狀態、並建立大貓熊之咬合石膏模型（可能爲全世界首例）及全口齒列 X 光片記錄等第一手資料。

口腔檢查約一小時左右順利完成，並進行約 20 分鐘的洗牙治療。口腔檢查結果，口腔黏膜及舌部顏色及質地正常、無潰瘍及不正常腫塊、關節開口度無明顯受限。齒列石膏模型分析發現，圓圓牙齒咬合正常，大白齒咬頭與咬合窩相當明顯，無過度磨耗現象，且沒有齒質缺損與裂痕。相反的是犬齒區有明顯齒質斷裂與磨耗，犬齒與小白齒間有明顯間隙，顯示圓圓可能多是利用此空隙來進行切割的動作，過大的咬力與纖維質過高的竹子造成局部牙齒的崩落與缺損，所幸象牙質結構及牙髓神經並未暴露。在口內牙齒檢查方面，雖無蛀牙，但齒面及齒縫有明顯牙垢及牙結石，導致牙齦有輕微發炎之牙周病症狀，但並無不正常之動搖性。全口齒列 X 光片分析，發現牙齒鄰接面無蛀牙、無明顯顎骨病變、無未萌出牙、無牙齒根尖病變，齒槽骨亦無明顯之吸收現象。

總結大貓熊圓圓的口腔檢查結果，目前存在的口腔兩大問題爲牙周病與犬牙磨耗，特別是後者需注意未來過度磨耗，可能會有咀嚼效率變差、冷熱敏感，甚至牙髓發炎疼痛之可能性。由於大貓熊以竹子爲主食，過去發現大貓熊在中年後常因牙齒受損，無法剝竹皮進食，進而

影響物種的生存。因此牙齒功能正常與否，對進食效率與健康狀態很重要，對中老年貓熊的健康衝擊尤大。因此我們建議每年至少洗牙並做口腔健檢一次，以維護圓圓口腔健康。

此外圓圓未來的口腔保健重點還應包括預防蛀牙的產生。依過去其他熊科動物的經驗，因為水果吃的比較多，所以齲齒的情況普遍嚴重；而貓熊因為以竹子為主食，所以這方面的問題應該會少很多。不過目前臺北市立動物園的大貓熊平時的主食是竹子和竹筍，另外還會搭配由黃豆、玉米、雞蛋、竹粉等調配烘製的窩窩頭及專用餅乾，以及胡蘿蔔、蘋果切塊作營養補充。相關食物的澱粉、糖類等成份，是有產生蛀牙的潛在可能。因此未來希望能透過訓練讓大貓熊能進行張嘴檢查口腔及牙齒狀況，並進一步做到每日主動式的口腔護理(如刷牙等)操作，維護口腔牙齒健康。

Workshop Abstract

Thursday, September 22, 2011

Importance of Innovation in North American Zoological Education

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North American zoo education is rapidly adapting to new communication styles and techniques. Increasing diversity of audiences, changes in access and ability through technology and the increasing expectations of visitors to immediate and substantive experiences are having dramatic changes on all aspects of zoological education. The expectations of conservation education have expanded beyond tradition programming to increased involvement in exhibit design, animal husbandry and training with animal ambassadors, spokespersons and experts on product development. Educators are also being viewed as a leading source of innovation and strategic planning at most facilities, noted by the growing number of executives that have come from the conservation and education ranks.

In this workshop, we'll review current education trends in North American zoos and give insight to how our field will change over the next decade. Then, we will participate in several activities that educators can use at their organizations to increase innovation and improve strategic planning, education product development and messaging. By the end of this workshop, you'll have several techniques and activities that will increase innovation at your facility.

AZEC - Next Host in 2013

Thursday, September 22, 2011

An Introduction by the President of JZAE

The History and Summary of the Japanese Zoo and Aquarium Educators (JZAE)

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Japanese Zoo and Aquarium Educators (JZAE) was born in 1975, and there is the history of 36 years. It is a meeting for the study to have the oldest history in a study of the education in the Japanese zoo and aquarium. Now, the 177 members participate and are registered. The members are comprised of volunteers, teachers, students, and the wide range including the company as well as the staff of the zoo and aquarium. JAZA (Japanese Association of Zoos and Aquariums) is in Japan, but JAZE is an original organization unlike this association. Members of JZAE are included lot of users of the zoo and aquarium. A characteristic of our organization is that they can participate in.

Until 1990, we held two times of meetings for the study in a year. It became held once a year afterwards from 1991. And we hold 51 times of study meetings so far. The mainly meeting places have been held in zoos and aquariums from all over Japan. In addition, we have held the meeting in a natural history museum and the Japanese Serow Center. At the time of a start of 1975, the name of the meeting called itself the Japanese Association of Zoological Gardens Educators. Afterwards, we changed the name of our organization in 1982 because the participation of the aquariums has been increased. In addition, we established the rules of our society and started to publish the study bulletin.

The first secretariat of our organization is the Japan Monkey Centre, and the first president was Mr. Goro Endo from the Ueno Zoological Gardens. Afterwards, the secretariat moved to the Saitama Children's Zoo, and Mr. Shizumu Hirose (Japan Monkey Centre) took over the second president, and then Mr. Yoji Kagawa (Riturin Zoo Park) assumed the third president. And, from 2000 of the 25th year, my aquarium (Marine World Umino-nakamichi) became the secretariat. At the same time, I took office as the fourth president. In addition, I enrolled as a member of the JZAE in 1981 and in this year took a member 30th years.

When I took office as the president in 2000, I began a fund system of the research grant. We run the study foundation for the income of a membership fee and the donation. And we support it to plural studies and dispatch the member to the overseas meeting.

Two years ago, we held the 50th anniversary meeting in Oarai Aquarium (Ibaraki Pref.), and there was two participants from the Hong Kong Ocean park. Last year, we held the 51st meeting in Itozu Zoo Park (Kitakyusyu C.), and there was a participant from the National Museum of Marine Biology & Aquarium, Taiwan. Existence of JZAE is known to the Asian countries little by little.

An institution in charge of holding can decide the theme of the meeting. I would like to introduce the theme of 5 years, the held institution in the past and the number of the presentation of the results of the study. The meeting of this year plans holding in New Enoshima Aquarium on this December 20-21. The theme is “cooperation with the universities.” I wait for the participation of all of you.

Time	Held theme	Hold of Zoo & Aquarium	Presen.
47 th	Education of environment	Noichi Zoological Park (Kochi Pref.)	27
48 th	Cooperation with the outskirts area	Lake Biwa Museum (Shiga Pref.)	32
49 th	Education to join the future together	Yokohama Zoological Gardens (Yokohama C.)	25
50 th	Explanation and communication	Oarai Aquarium (Ibaraki Pref.)	22
51 st	Play and education	Itozu Zoo Park (Kitakyusyu C.)	29

I introduced a summary of the history and the activity of JZAE. Our JZAE is planning the acceptance of the 4th meeting of very authoritative AZEC. The city holding AZEC is not yet decided. However, we wait for all of you in Japan two years later. Please support the success of the meeting in Japan. I thank all of you for the understanding very much.