

# Kadoorie Farm and Botanic Garden

ANNUAL REPORT 2009



To increase the awareness of our relationship with the environment and bring about positive change in the world through conservation and education.

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## **Kadoorie Farm and Botanic Garden Annual Report 2009**

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# About KFBG

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Kadoorie Farm and Botanic Garden (KFBG) is situated below the northern slopes of Hong Kong's Tai Mo Shan mountain. Two steep spurs enclose its deep-set valley, which shelters streams, woodlands, orchards and vegetable terraces, together with conservation and education facilities.

In the post-war years, Hong Kong was flooded with destitute immigrants. Many had traditional agricultural knowledge of crop production and livestock farming. They required support to rebuild their lives. In response to these pressing human needs, Lord Lawrence and Sir Horace Kadoorie established the Kadoorie Agricultural Aid Association (KAAA) in 1951. The Kadoorie brothers, part of a well-established business family, saw wealth as a sacred trust to benefit mankind. The KAAA provided agricultural input, interest-free loans and training. With such aid, numerous small wells, irrigation channels, terraces, pathways, pigsties and houses were built. The success of the KAAA sponsored a self-help movement that brought many laurels, including the Ramon Magsaysay Award in 1962.

Hong Kong's unparalleled prosperity since the mid-1970's has led to a decline in farming. In the midst of wider social change and rapid economic expansion, a new direction was needed. Growing ecological knowledge indicated that Hong Kong and South China's natural diversity was under much greater threat than previously thought. In January 1995, the Legislative Council of Hong Kong passed an Ordinance (Kadoorie Farm and Botanic Garden Corporation Ordinance Chapter 1156) incorporating Kadoorie Farm and Botanic Garden as a non-profit corporation. The new focus was to promote conservation education, environmental sustainability, and the protection of biodiversity in Hong Kong and beyond.

KFBG has a unique public-private partnership. Though KFBG is a public corporation, its funding and management is in private hands. A Board of Directors appointed by the Trustees of the Kadoorie Foundation independently manages KFBG. KFBG spreads over 148 hectares on land leased from the Government. KFBG runs many collaborative programmes with government agencies, universities and non-government organisations.

# MISSION & VISION

## MISSION

We exist to increase the awareness of our relationship with the environment and bring about positive change in the world through conservation and education.

## VISION

KFBG will help create a world without environmental crisis, in which conservation of the natural heritage and sustainable living enable people to live in contentment, with respect for each other and nature.

## Core Values

### Sustainable Living

We believe in simple and responsible lifestyles. We examine the impact of all our actions, and strive to take only what we need, having regard for future generations and the natural environment.

### Fairness and Justice

We strive to be fair and accountable in the way we do things. We value socially equitable systems that protect natural and cultural diversity and the interests of all generations.

### Love and Happiness

We value love for the environment and awareness of the interrelationship of all things. We recognise the intrinsic worth of people and nature and have compassion and respect for all life. We believe our own happiness lies in creating and sharing happiness with others.

### Learning and Openness

We believe in learning, continuous improvement, respecting different viewpoints and participation. We translate environmental principles into practical, holistic solutions, balancing scientific objectivity and creative intuition.

### Professionalism

We strive to be caring and committed, and to uphold professional standards and best practices. We value our independence as well as our partnerships with individuals, communities and organisations.

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## **DESTINY**

Who are we?  
What is this world?  
What is our task?

Did we evolve from apes?  
From micro-organisms?  
From the stars?

Or did we fall from grace  
Forgetting that this world  
Is a reflection of our own glory  
Of our own power...

Without the elements  
What are we?  
Beyond the elements  
What is Awareness?


One thing is for sure:  
We are all connected  
By the Earth  
Through the breath  
In the Heart

We rise and fall together  
Choosing hatred or compassion  
Fear or love  
Fragment or whole...

Destiny is in our hands

**Andrew McAulay**

# PREFACE



I thank and give praise to our committed staff team of 230 for their hard work, innovation, flexibility, energy, skill, spirit and passion. Whether they are a Department Head, a guard, a specialist conservation officer, an educator teaching organic farming, or connecting people to nature, or a worker planting trees, weeding, feeding turtles or sweeping paths, their individual contribution is vital.

I'd also like to recognize and thank the team of over 300 volunteers without whose goodwill and selfless contribution we could not do our work so effectively. Some volunteers work with us almost every week of the year.

I must also thank the large number of partners in Hong Kong, South China and indeed worldwide with whom we work. These include NGOs, government departments, schools, universities, community groups, academics and other specialist experts. We value our collaboration with you.

In 2009, we invited three external specialists with broad experience and viewpoints to evaluate our work and give recommendations. The evaluation exercise was well received by our staff members and we were happy to see that no stones were left unturned, and, all our strengths and weakness were rigorously examined and identified. The final evaluation reports provided much food for thought.

The evaluation exercise naturally led to a major review of our strategy, last reviewed in 2006, and in the second half of 2009 (and beyond) much work has gone into discussing, rethinking and reworking the KFBG strategy. We have harnessed the power of specialist computer software to help us clarify the management roles and structural challenges we face in implementing the strategy. I am thrilled to see that we are now much clearer, and much more aligned in our planning and organisation.

Three key strategic developments will be an expansion of our community-based work in helping people to gradually transition to low carbon living, with a focus on the Tai Po area as a model for Hong Kong; an expansion of our education work to include regular residential retreats in which participants can connect deeply to nature; and a more rigorous scientific approach in our conservation work.

I look forward to the implementation of this new strategy.

**Andy Brown**  
*Executive Director*



# EDUCATION

*In 2009, guided tours continued to be very popular amongst the visitors to KFBG and the Education Department organised more than 150 guided tours for almost 7,000 people to help them better appreciate the natural world and to understand the work of KFBG. The Education Department also worked in partnership with local schools and the Education Bureau of the Hong Kong Government to develop and offer a range of curriculum-based programmes. Our volunteers contributed more than 7,300 hours helping in various programmes and events throughout the year.*



Our volunteers helped in various Farm events and education programmes throughout the year.



A hand woven panel using the SAORI Hand-weaving Technique on display during an exhibition at KFBG in December 2009.

## 1. Events and Activities

### A. Visitors to KFBG

In 2009, overseas visitors to KFBG included staff of the National Parks Board (Singapore), University of Plymouth (UK), and the Wildlife First Aid Station of the Taiwan Endemic Species



Visitors from the National Parks Board (Singapore) on 15<sup>th</sup> June, 2009.

Research Institute. Local visiting groups included officials from The Consulate General of Israel in Hong Kong, and, the Forestry Department of the Dungguan Government. Each year, staff and students from local universities such as The University of Hong Kong, City University of Hong Kong, The Chinese University of Hong Kong, and, The Hong Kong Institute of Education visit KFBG.



Visit of Staff from the Wildlife First Aid Station (Taiwan) on 25<sup>th</sup> November, 2009.

### B. Guided Tours

Guided tours are popular amongst the visitors to KFBG. During 2009, the Education Department organised 157 guided tours for 6,949 people to help them understand the work of KFBG and to better appreciate the natural world.

### C. KFBG Night Safari

In 2009, the department conducted nine 'Night Safaris' for school teachers and organisations such as:

- The Institute of Vocational Education, Shatin
- The Chinese University of Hong Kong
- Oxford University Press
- The Institute of Electrical and Electronics Engineers





Japanese Pipistrelle.



Chinese Porcupine.

A total of 132 people walked the hillsides of KFBG at night, catching sight of nocturnal creatures such as Japanese Pipistrelles, Chinese Porcupines, Chestnut Spiny Rats, Fireflies, Moths and Wild Boar.

## 2. Educational Programmes

The Education Department worked in partnership with local schools and the Education Bureau of the Hong Kong Government to develop and offer a range of curriculum-based programmes.

### A. School-based Curriculum Development

#### New Senior Secondary Geography Curriculum Development with the Education Bureau

A new series of inquiry-based field study activities for local school students related to agro-forestry and organic farming was developed for the New Senior Secondary Geography Curriculum. This project was developed in June 2009 in collaboration with the Geography Team, Personal, Social & Humanities Education, of the Education Bureau.

In addition, teacher workshops were organised for local school teachers. Two examples of such workshops are:

#### Sustainable Agriculture Teacher Seminar for the New Senior Secondary Curriculum

In order to support the implementation of the New Senior Secondary Geography Curriculum, the Education Bureau (Personal, Social and Humanities Education Section) and KFBG jointly organised a seminar for Geography teachers in May 2009 to introduce the concepts of sustainable agriculture and agro-forestry, and, the use of KFBG facilities for field study.

#### Woodland - Day and Night Teacher Workshop

This teacher workshop was held in November 2009 to offer an opportunity for educators to update their knowledge about woodlands in Hong Kong. The workshop also involved a demonstration of wildlife survey methods, an introduction to agro-forestry, site visits, a night walk and discussion sessions.

### B. Workshops & Training Courses

#### i. Woodland Ecology Fieldwork Studies

This programme was held six times from January to March 2009. A total of 109 A-level Biology/Geography students had the opportunity to conduct fieldwork at Lam Tsuen Country Park. This programme enables students to compare and understand the differences in woodland structure and composition between a native woodland and an exotic woodland.

#### ii. "Bats in Macau" Seminar and Workshop

Kadoorie Farm and Botanic Garden was invited by the Seac Pai Van Nature Education Centre, the Civic and Municipal Affairs Bureau of the Macau Government to organise a series of seminars and workshops for educators, professionals and the general public. The "Bats in Macau" Seminar and Workshops, held between September and November 2009, were developed to enhance awareness about the roles of bats in nature among teachers and students in Macau. More than 150 school teachers and members of the public joined these programmes.



Participants of the Sustainable Agriculture Teacher Seminar for New Senior Secondary Geography Curriculum.



Wild boar sighted during the "Woodland - Day and Night" Teacher Workshop.



Local students attending the "Woodland Ecology" Fieldwork Studies programme.



Dr. Gary Ades giving a talk at the "Bats in Macau" Teacher Workshop.





In 2009, our volunteers contributed more than 7,000 hours helping in various programmes and events.

### 3. Volunteer Services

During the year, our volunteers helped in providing guided tours, preparations for education programmes and various Farm events. These included the Nature Fun Days, Art and Environment Workshop, The Kadoorie Brothers Memorial Race, Night Safari, Shuttle Bus Interpretation Service and assistance with fieldwork around the Farm. Their participation contributed to the success of these activities. Volunteer services co-ordinated by the Education Department during the period from January to December 2009 is shown in the following table:

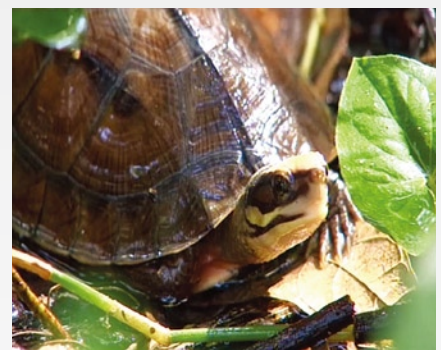
	No. of Volunteer-Days	No. of Volunteer-Hours
Guided Visits	329	1,045
Nature Fun Day programme	113	791
Fieldwork about the farm	266	2,775
Education Programmes preparation & administration work	166	770
Manning the Farm Shop	5	35
Art Exhibition	11	77
Art Workshop	29	203
Managing the Agricultural Heritage Exhibition at Kwun Yum Garden	84	588
Nature Education – Fun & Games	73	438
KFBG Shuttle Bus Interpretation Service	98	588
<b>Total</b>	<b>1,174</b>	<b>7,310</b>

### 4. Media Exposure

Between 1<sup>st</sup> January and 31<sup>st</sup> December, 2009, there were 137 newspaper and magazine reports about KFBG, and, 11 television and radio interviews of our staff. Some highlights are: in January, a TV documentary series “Hong Kong Geographic” produced by Radio Television Hong Kong was aired. In the series, several KFBG staff introduced the ecology of different habitats around Hong Kong to help increase people’s awareness of the need to protect our environment. In March, a TV programme titled “Guardians of Nature” which presented KFBG’s conservation work on the Golden Coin Turtle was broadcast on Ushuaia TV in France. The programme helped raised global concern about this turtle species. In July, an adult porcupine, trapped in a catch-water system, was rescued by the Fire Services Department; it was transferred from the Society for the Prevention of Cruelty to Animals to Kadoorie Farm & Botanic Garden. Twelve local newspapers reported this piece of news. Throughout the year, reporters from television channels, newspapers and magazines have frequently covered the activities of KFBG Nature Fun Day and LOHAS Square in Central. During the same period, six press releases were issued by KFBG.



LOHAS Square featured in the ‘Green Life’ column of Hong Kong Economic Times (25<sup>th</sup> April, 2009).



A documentary was produced about the conservation of Golden Coin Turtles in Hong Kong.



Newspaper coverage of a porcupine trapped in a water channel in Tsuen Wan (30<sup>th</sup> July, 2009). The porcupine was later transferred to KFBG for treatment and then released back to the wild.



Yellow Bus, a children’s magazine, reporting on Nature Fun Day at KFBG. The article was published on 1<sup>st</sup> October, 2009.

## 5. Art and Culture Programmes & In-House Design Projects

During 2009, the Education Department organised art and culture programmes, and designed numerous displays, signage, and various other items for use around the Farm. Examples include:

Art and Culture Programmes	
1. "Stroll Through the Forest" art and environment exhibition (13 <sup>th</sup> - 27 <sup>th</sup> March, 2009)	
2. Hong Kong Youth Art Foundation (HKYAF) – Environment Sculptures (20 <sup>th</sup> May, 2009)	
3. Environmental Art Camp 2009 (6 <sup>th</sup> - 8 <sup>th</sup> December, 2009)	
4. Weaving Into Nature – SAORI Hand-weaving Project Exhibition (7 <sup>th</sup> December, 2009 to 3 <sup>rd</sup> January, 2010)	
In-House Design Projects	
Examples of Creative Design Projects during the period include:	
1. Victoria Park Flower Show 2009 – "Frog Watch"	4. Agricultural Heritage Exhibition at Kwun Yum Garden Building
2. Vine Installation at the Piers Jacobs Wildlife Sanctuary	5. Design of a promotion poster for a book on birds
3. "Native Orchids of Hong Kong" Exhibition at Lung Fu Shan Environmental Education Centre, The University of Hong Kong	6. Design of the Tee-shirt for the Memorial Race 2009
	7. Replacement of the Kwun Yum signage at the summit of Kwun Yum Shan



- [1] Poem Signage at the Orchid Haven spring water pool.
- [2] An upright display of native orchids at the Orchid Exhibition at Lung Fu Shan Environmental Education Centre, The University of Hong Kong.
- [3] Agricultural Heritage Exhibition at the Kwun Yum Garden Building.
- [4] Vine Installation at the Piers Jacobs Wildlife Sanctuary.
- [5] The KFBG book on the Ecology of the Birds of Hong Kong.
- [6] New signage for the Kwun Yum Panel at the summit of Kwun Yum Shan.
- [7] Design of the Tee-shirt for the Memorial Race 2009.

# FAUNA Conservation

*In 2009, the Fauna Conservation Department continued its core programme to conserve and rescue wildlife in Hong Kong, and the Wild Animal Rescue Centre received 564 animals. Several significant conservation projects were also initiated during the year including the on-going efforts to save the Yangtze Giant Soft-shelled Turtle from extinction.*



**Yangtze Giant Soft-shelled Turtle in Suzhou Zoo (Jiangsu Province). These are the only known living pair left in the world.**

**One of the juvenile Ploughshare Tortoises that grabbed global attention and focused chelonian conservationist's attention, worldwide, on KFBG's Wild Animal Rescue Centre. This species is believed to be the world's rarest tortoise.**

## 1. Wildlife Rescue

We discovered again this year how damaging typhoons can be to our local birdlife, especially when the typhoon arrives during the breeding season for some species. Typhoon Molave hit the territory in July and the rescue centre received more than 10 young pond herons and egrets; birds that are particularly susceptible to strong winds as their nests are often constructed in tall trees and bamboo.



**Chinese Pond Heron chicks rescued from Ping Long in July after Typhoon Molave hit Hong Kong.**

The Wild Animal Rescue Centre (WARC) received over 160 native birds for rehabilitation during the year. This is the highest number since the rescue programme was established in 1994. The increase probably reflects the faster pace of infrastructure development in Hong Kong but it also appears that there is wider awareness among the public regarding what to do when injured birds are discovered. Several species which were received by the centre for the first



**Northern Goshawk received by the Rescue Centre in November. He was released, one month later, in the Mai Po Marshes Nature Reserve.**

time included: a Brown Wood Owl, Black-naped Oriole, Northern Goshawk, Great Cormorant, Eye-browed Thrush, White-throated Rock Thrush, Large-billed Crow and Oriental Turtle Dove. We maintained a release success of over 65% for the native birds received and rehabilitated.



**Brown Wood Owl chick (photographed in August), four months after arrival, with more adult plumage.**

A brief synopsis of some interesting rescue cases this year includes a Tokay Gecko released on the Peak (on Hong Kong Island) in February. Several fairly restricted populations of this gecko are found in Hong Kong. It is nice to see this species being released, as populations have been decimated across Southeast Asia, primarily, for the food and Traditional Chinese Medicine trades.

A young female Red Muntjak (Barking Deer) rescued from a water catchment by the Society for the Prevention of Cruelty to Animals (SPCA) and passed to KFBG was successfully released on our hillside in March.

A Eurasian Eagle Owl which was discovered trapped on a construction site in Tuen Mun by site contractors was

rehabilitated and released in July. The two contractors who originally saved the bird were invited to watch the bird being released back to the wild.

The department also received for temporary holding 3 Madagascar Ploughshare Tortoises which are amongst the world's Top Ten rarest chelonian species. The rescue team is working closely with the Hong Kong Government to find a suitable long-term conservation home for this species.

A much awaited project was completed in August. We adopted the international ARKS database system in 2004 and have now completed entering all the pre-2004 records [to join all the records entered since 2004] into the database. It will now be easier to retrieve records archived in the computerized database regarding any cases that were handled in the 1990s.

#### Animals rescued since the establishment of the rescue programme in 1994:

a) Total Number of Animals received at the Wild Animal Rescue Centre from 1994 to December 2009:

<b>Mammals</b>	445
<b>Birds</b>	1,549
<b>Reptiles</b>	17,909
<b>Stray snakes</b>	3,643
<b>Grand Total</b>	<b>23,546</b>



A Tokay Gecko returns to the wild on Hong Kong Island in February.



A young female Barking Deer in rehabilitation before successful release on the KFBG hillside in April.

b) Total Collection Figures from the Animal Record Keeping System for the period from 1<sup>st</sup> January to 31<sup>st</sup> December, 2009:

Animal Group	Total in collection at 1/1/2009	Received/Captive Bred	Released/Relocated	Died/Euthanised	Total in collection at 31/12/2009
<b>Birds</b>	91	160	84	86	81
<b>Mammals</b>	70	39	13	24	72
<b>Reptiles*</b>	827**	355	326	284	572
<b>Amphibians</b>	13	10	7	5	11
<b>Fish</b>	234	0	0	0	234
<b>Total</b>	<b>1,235</b>	<b>564</b>	<b>430</b>	<b>399</b>	<b>970</b>

\* Excluding stray snakes received from the Hong Kong SAR Police.

\*\* Including eggs laid while being held in the Rescue Centre.

## 2. Collaborations

Several significant collaborations were initiated in 2009. KFBG staff and experts from the Agriculture, Fisheries and Conservation Department (AFCD), Ocean Park and The University of Hong Kong worked together to develop a Conservation Action Plan for Romer's Tree Frog, a locally endangered species. At the time of writing, the action plan has now been produced and the department is considering some of the roles that KFBG will undertake over the next few years to help conserve this flagship species in Hong Kong.

The KFBG veterinarian travelled to Suzhou Zoo (Jiangsu Province) in July to assist with veterinary and husbandry work related to attempts to save the Yangtze Giant Soft-shelled Turtle from extinction. This is an on-going project which involves Chinese zoo personnel and several of the world's most prominent chelonian experts. Unfortunately, the eggs laid in 2009 by the female of the pair of turtles at the zoo were infertile.



**Romer's Tree Frog is Hong Kong's most well known native species.**



**The Yangtze Giant Soft-shelled Turtle project involves Chinese zoo personnel and several of the world's most prominent chelonian experts.**

A collaboration with The University of Hong Kong commenced in October with a postgraduate student carrying out a population study of the wild Big-headed Turtles on our hillside. This study builds on work started in 2002 to understand the ecology of this species in our stream. The study involves radio-tracking individuals and should provide useful information to assist future land management decisions.

Another 2-year project also commenced in October with the Microbiology Department at The University of Hong Kong. Wild animals entering the rescue centre and those in long-term captivity will have mouth and cloacal swabs taken for analysis to help gain understanding about emerging viral diseases in wild animals.

The Tai Po Environmental Association requested for assistance to carry out a moth survey of the Fung Yuen Butterfly Reserve. Two surveys were undertaken in April and October with 450 species being identified including 4 new Hong Kong records.



An unidentified snout moth (*Pleuroptya* sp.) – a likely new species for Hong Kong.



Tai Po Environmental Association volunteers assisting with the moth survey at Fung Yuen SSSI & Butterfly Reserve in October.



*Ramadasa pavo* – also spotted in the survey.

### 3. Environmental Watchdog

In 2009, 18 letters of concern and 29 reviews related to planning applications were submitted to relevant Government departments. The issues ranged from illegal in-filling of agriculture ponds, to unauthorized structures or damage to land zoned as Green Belt. An objection was lodged to the Town Planning Board in March concerning the draft Sham Chung (Sai Kung) Outline Zoning Plan. It was felt that there was inadequate

protection of the abandoned lowland farming land.

Indiscriminate dumping of construction and demolition wastes continues to be a widespread problem in the New Territories and has been the subject of several consultations. Prompt action was taken by Government when notified of illegal dumping at the ecologically important Luk Keng marshes in September. An enforcement notice

was issued to the landowner to remove the waste and re-instate the land. A similar case was reported at Ho Sheung Heung which later received much media attention.



Illegal filling of ponds with construction and demolition wastes at Luk Keng, North East New Territories.



Illegal filling of ponds with construction wastes at Nam Sang Wai.

## 4. Publications

Staff were involved in 8 publications during 2009.

The book 'Ecology of the Birds of Hong Kong' was published in August. This should prove to be an important reference text for both Hong Kong and overseas academics, consultants and conservationists. It combines the results of more than a decade of avian research carried out by several local experts and should also help to highlight some local hot spots for birds which require continued protection.



The book on "Ecology of the Birds of Hong Kong".

Internal publications produced included 'The Turtle Plastron Report' which highlighted the numbers and species of endangered turtles involved in a turtle shell seizure by the Hong Kong Government in 2006. Volunteers assisted with counting shells and carrying out measurements to provide useful data for the turtle research community, regarding species that were part of an illegal trade shipment. This publication (available on [www.kfbg.org](http://www.kfbg.org)) was also released as an electronic paper on the IUCN Tortoise and Freshwater Turtle Specialist Group website. The second edition of the Ecological Advisory Programme's Standard Operating Procedure was published in November and is also available on our website.

Three education leaflets were produced, two as part of a series called 'Let's Care about our Natural Heritage' highlighting Wild boar and Macaques in Hong Kong, and, the third was a leaflet introducing the diverse world of amphibians on the KFBG hillside, intended for regular guided visits and specialist workshops.

Scientific peer-reviewed contributions included a collaborative study with the Hospital Authority on the "Oral bacterial flora of the Chinese Cobra and Bamboo Pit Viper in Hong Kong SAR, China (Hong Kong Medical Journal)" and, two publications co-authored by a staff member, Dr. Roger Kendrick, on a local moth family, Oecophoridae. The co-authored papers contain results from a monthly moth survey programme at KFBG which describe 6 species from our hillside that were new to science.



Chinese Cobra – a study was conducted with the Hospital Authority on the microbial composition of its mouthparts.



The Turtle Plastron Study Report was published in August 2009.



Turtle Identification Sheet presented in the Report.



This manual was produced to facilitate the monitoring and protection of ecologically sensitive areas and sensitive zones in statutory plans in Hong Kong.

## 5. Education & Outreach Activities

The theme for the Victoria Park Flower Show in March 2009 was 'Frog Watch'. Display materials and presentations were developed to raise awareness about our local amphibians and global concerns about emerging diseases and climate change which are already seriously affecting this diverse group of animals in some regions of the world. One of the things we did was to make connections between the daily lives of people and the effect on a frog in the wild. We are continually looking for ways to connect people with the environmental threats that are becoming a serious concern to all of us.

During the year, nine Night Safari events were jointly undertaken with the Education Department. Wild animal sightings included porcupines, Masked Palm Civets and several bat species. This activity continues to be well received by the invited groups.



KFBG's 2009 Hong Kong Flower Show Landscape Display - "Frog Watch".



Hong Kong Flower Show 2009 attracted over 538,000 visitors.



(From left) Species seen at Night Safari – Porcupine, Masked Palm Civet and Chinese Horseshoe Bats.

Animal Keeper talks have now become a regular event to coincide with guided school visits. Talks have taken place at Monkey Haven, Raptor Sanctuary and the Wild Boar enclosure. Keepers and Conservation Officers talk to visitors about the different animal groups, wildlife-people conflicts in Hong Kong and behaviour training of our display animals.



School children enjoying a close encounter with a Black Kite during a "Keeper Talk".



# FLORA Conservation

Staff of the Flora Conservation Department continued to engage in professional skills training throughout the year. There were improvements to a number of landscape and garden displays in the farm. In addition, new staff were engaged for the Orchid Conservation Section, extensive improvements were made to the orchid horticulture facilities, and, the implementation of a new computerised orchid database system were completed.



Seedling production beds at the Native Tree Nursery.



*Papilio memnon* visiting a Fire Spike (*Odontonema strictum*) in our Butterfly Garden.

## 1. Tree Management and Conservation

During 2009, expert consultants provided professional skills training workshops to our tree management staff. Altogether, eight members of staff joined four courses on Professional Tree Climbing; Tree Risk Assessment and Risk Reduction Recommendation, Basic Tree Rigging Practices and Tree Climber Aerial Rescue.

The onset of the typhoon season in Hong Kong poses a major hazard to trees. On 19<sup>th</sup> July, Typhoon Molave hit Hong Kong causing significant damage to trees in KFBG with 19 trees that came crashing down in the wake of the storm. The Tree Management Team worked continuously to remove trees that posed a danger and had to be cut down.

Altogether, 67 hazardous trees were cut down and another 188 trees had to be pruned. During the year, the Team carried out an additional 109 operations to remove various hazards posed by trees.

A risk assessment survey of 344 trees close to paths, roads and buildings was completed and maintenance recommendations were implemented by the Tree Management Team.



Tree Risk Assessment course - discussion on the risks posed by a hazardous tree.



"Tree Risk Assessment and Risk Reduction Recommendation" Training in June by the trainer - Mr. Kevin Eckert.

### Native Tree Nursery

At the end of the year, there were about 32,000 seedlings comprising 300 native tree, shrub and climber species held in stock at our Native Tree Nursery. During 2009, staff of the Native Tree Nursery undertook field collections and about 49,700 seeds were collected from 183 native tree and shrub species from around Hong Kong.

On Earth Day (22<sup>nd</sup> April) 800 seedlings of native tree species were supplied for a staff tree planting activity on our hillside. In addition, seedlings were also supplied to external organisations as indicated below:

Organisation	No. of seedlings donated	No. of seedlings sold	Total revenue (HK\$)
NGOs	245	3,453	17,272
Schools, universities & government departments	--	15	1,932
Business organisations	--	1,321	13,588
<b>Total</b>	<b>245</b>	<b>4,789</b>	<b>32,792</b>

### 2. Seed Bank

During 2009, Prof. Hugh Pritchard, Head of Research, Seed Conservation Department at the Millenium Seed Bank Project, Kew, visited twice during the year and held discussions for collaboration on scientific programmes and seed banking projects.

### 3. Landscape and Gardens

There were improvements to a number of landscape and garden displays under the management of the Flora Conservation Department.

The Cactus Greenhouse was re-opened in May after renovation of the building structure and landscape setting for planting of cacti.



Outlook of the Cactus Greenhouse after renovation.

A new landscape design for the green roof above the Reception Building was completed in early August. The species used for planting on the roof are low maintenance, require relatively little water and can tolerate high sunlight intensity. These are:

1. Blue Grass (Short leaved) (*Ophiopogon japonicus*)
2. Sedum (*Sedum formosanum*)



Sedum and Blue Grass were planted on the green roof at the Reception Building.

In order to better manage water conservation and to reduce the amount of water that we draw from our stream, we have installed automatic irrigation systems in our gardens such as the Butterfly Garden and Fern Walk. We will continue to extend such water conservation systems to other landscaped areas within KFBG in the coming years.

A monitoring study on the frequency of visits by butterflies to nectar source plants was initiated in September 2009, so as to improve upon the types and species of plants introduced into the Butterfly Garden. Three plant species, Lantana (*Lantana camara*), Fire Spike (*Odontonema strictum*) and Chinese Ixora (*Ixora chinensis*), were observed to be frequently visited by butterflies.



Collecting roadside leaves for mulching and use in animal enclosures.

### 4. Recovery of Organic Waste Materials

As part of sustainability practices in the farm, fallen leaves on the roadside are collected for use in various Farm Operations.

In 2009, about 1.6 tonnes of roadside leaves were used for mulching in the orchards and tea gardens by the Sustainable Living and Agriculture Department.

In addition, the Fauna Conservation Department used about 3.5 tonnes of leaves for substrate in the animal exhibits and enclosures, e.g., the Piers Jacobs Wildlife Sanctuary, Reptile Garden and Reptile Lookout.

### 5. Facilities Improvement

Lightning protection systems were installed in various buildings such as the Potted Plant Greenhouse, Cactus Greenhouse and potting sheds in the Plant Nursery area to safeguard staff and visitors against lightning strikes.

## 6. Collaboration

KFBG worked with Botanic Gardens Conservation International (BGCI) to organise the BGCI-KFBG Travel Scholarship Programme 2009. The theme for 2009 was on 'Concepts and Techniques for Tree Management'. Four young scientists from botanic gardens in mainland China were trained in various aspects of arboriculture.

Name	Position/Role	Organisation
<b>Ms. Chen Xiao-min</b>	Garden Landscape Management	Shanghai Botanic Garden
<b>Mr. Chen Ji-jie</b>	Deputy Director of Landscape Management	Hunan Forest Botanical Garden
<b>Mr. Yu Zhi-shui</b>	Forestry Engineer	Beijing Teaching Botanic Garden
<b>Ms. Niu Yan-li</b>	Assistant Professor	Lushan Botanical Garden

The Flora Conservation Department collaborated with a fern expert Dr. Yan Yu-hong from the School of Life Science, Hunan University of Science and Technology to study the distribution of ferns in the "Danxia Landform" area of Hunan. Two of our staff members Ash Kum and Wu Wai Wa joined the field work in August 2009.



Flora staff conducting survey of ferns in the "Danxia Landform" area, Hunan Province.

## 7. Community Services & Education

KFBG presented a landscape exhibit with the title "Frog Watch" in the Hong Kong Flower Show 2009. A team of 38 volunteers was on duty throughout the flower show which attracted over 538,000 visitors.

Two internship students from the Hong Kong Baptist University were attached to the Flora Conservation Department from June to August. They participated in conservation work of native species in the Native Tree Nursery, horticulture practices in the Landscape Section and handling plant specimens in the Herbarium.



Hong Kong Baptist University Intern monitoring tree seedling growth at a planting site on our hillside.



BGCI participants learning basic ropework for tree climbing.



BGCI participants practicing tree climbing techniques.



Mr. Mark Isaac-Williams and Ms. Rose Ip, a volunteer, planting new beds with orchids on Terrace No. 2 at Orchid Haven.

## 8. Orchid Conservation

In April 2008, Dr. Philip Cribb (formerly of the Royal Botanic Gardens, Kew) evaluated the work of the Orchid Conservation Section (OCS) and produced a report. A number of recommendations from this report were implemented in 2009.

Foremost amongst these was the engagement of new staff. Dr. Stephan Gale joined OCS as a Senior Conservation Officer in February 2009, and Dr. Wang Jing as an Assistant Conservation Officer in October 2009.



Volunteer explaining the display to children at the Hong Kong Flower Show 2009 at Victoria Park.

Mr. Mark Isaac-Williams was engaged as a part-time consultant. Mr. Isaac-Williams' association with KFBG dates back to a period from 1979-1984 when he worked with Mrs. Gloria Barretto to help develop the orchid gardens. Many of the orchids he originally gathered still form the core of the current living orchid collection. His main responsibility at KFBG is to oversee the rejuvenation of the orchid gardens at Orchid Haven.

In 2009, there was extensive rationalisation of the living stock of orchids, improvements to the orchid horticulture facilities and the implementation of a new computerised orchid database system.

The KFBG Orchid Database (at the end of March 2010) contained about 5,400 records. These comprise *circa* 2,200 records from the living collections at KFBG, and a further 3,200 records relating to herbarium specimens of orchids collected in Hong Kong over the last 160 years and now held at six herbaria (Royal Botanic Gardens, Kew; British Museum, KFBG, the Agriculture, Fisheries and Conservation Department herbaria; The Chinese University of Hong Kong and The University of Hong Kong), plus a substantial number of OCS sightings of wild orchids amassed over the 12 months of 2009.

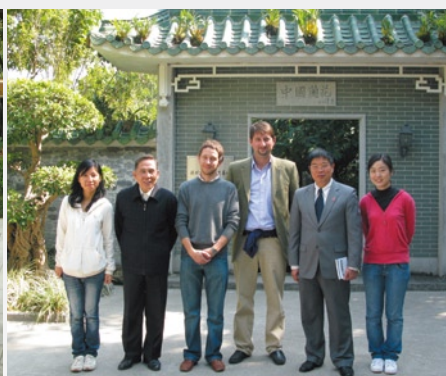
The information in the database will allow for a robust analysis of species distribution and the conservation status of orchids for the forthcoming book on the Orchids of Hong Kong. In 2009, much effort was expended towards preparation of the manuscript for the book. Such work involved overseas trips to the herbaria at the Royal Botanic Gardens, Kew and the British Museum. In addition, a digital photo library covering all of the native orchid species had to be set-up as an essential resource for the production of the book. This involved follow-on work such as image restoration and colour adjustment for many old slides. This forthcoming book is an essential piece of work since it will form the foundation for all future *in-situ* and *ex-situ* conservation projects undertaken by OCS.



Populations of rare orchid species – Hong Kong Lady's Slipper Orchid (*Paphiopedilum purpuratum*) and Hong Kong Eulophia (*Eulophia zollingeri*) have been found during OCS survey work, in 2009.



Standing log mounted with epiphytic orchids at the Native Orchids of Hong Kong exhibition at Lung Fu Shan Environmental Education Centre.



OCS staff and Dr. Gunter Fischer (now designated Head of Flora Conservation Department) met with senior staff at the National Orchid Conservation Centre of China, Shenzhen, on 24<sup>th</sup> November, 2009.

An exhibition on the "Native Orchids of Hong Kong" was held at the Lung Fu Shan Environmental Education Centre of The University of Hong Kong in April 2009, under the auspices of the Hong Kong Artistic Orchid Association. A purpose-built setting comprising free-standing logs mounted with epiphytic orchids, pots of terrestrial species and explanatory boards were on display from 4<sup>th</sup> to 19<sup>th</sup> April, 2009.

Dr. Stephan Gale attended the 1<sup>st</sup> Guangxi International Orchid Conservation Symposium in Leye City, Guangxi Province from 20<sup>th</sup> - 25<sup>th</sup> May, 2009. The meeting was convened by the Guangxi Forestry Bureau to mark the establishment of the Yachang Nature Reserve, a site with exceptionally rich orchid flora.

OCS staff and Dr. Gunter Fischer (now designated Head of the Flora Conservation Department), visited

Fairylake Botanical Garden and the National Orchid Conservation Centre of China (NOCC) in Shenzhen in November 2009 to establish a dialogue and meet with counterparts working in the field of orchid conservation. Prof. X. Q. Chen and Prof. Z. J. Liu (Director) of the NOCC hosted the visit to various facilities in Shenzhen, and, a meeting with Dr. L. Zhang of the Fairylake Botanical Garden.

### Publications

Dr. Stephan Gale assisted with the preparation of a book on the orchids of China. The citation for this book is as follows:

Chen, S.C., Liu, Z.J., Zhu, G.H., Lang, K.Y., Ji, Z.H., Luo, Y.B., Jin, X.H., Cribb, P.J., Wood, J.J., Gale, S.W., Ormerod, P., Vermeulen, J.J., Wood, H.P., Clayton, D. & Bell, A. (2009).

**Orchidaceae.** In: Wu, Z.G., Raven, P.H. & Hong, D.Y. (eds.) Flora of China. Vol. 25. Science Press, Beijing and Missouri Botanical Garden Press, St. Louis.



# Sustainable LIVING & AGRICULTURE

2009 was a year of action for the Sustainable Living and Agriculture Department (SLA) in building up momentum of the local community to combat climate change and to address the issues of peak oil. SLA has been progressively developing alternative solutions to reduce our reliance on the use of fossil fuel in agriculture. In addition, various initiatives were implemented to improve upon organic resource recovery in our Farm operations. Milestones in 2009 include:



A day-camp for SLA volunteers, who contributed a total of 8,000 hours of service in 2009.

This wildlife pond re-uses treated waste water to demonstrate the ecological functions of a wetland.

## 1. Farm-based Programmes

A new Fruit Forest display was established in the lower farm to support on-going research, farmer training and public education about **agro-forestry**. Agro-forestry replaces soil-degrading, pest-attracting mono-crop orchard systems with mixed plantings of fruit trees and ground cover that mimics natural woodland structure. Since its opening in May 2009, two training courses have been organised for over 50 local farmers and interested individuals. Teacher training was delivered in June to prepare for the use of the display as a field study site for the 'Enquiry-based Fieldwork for Geography' programme under the Education Bureau for raising awareness about sustainable agriculture practices. Furthermore, there were ten tours organised for special groups from mainland China, local universities, professionals and NGOs who wanted to learn about how agro-forestry can serve as a sustainable alternative to mono-culture orchard systems.

Our **Orchard Rejuvenation Plan** has entered its third year. The plan is designed to address issues related to soil erosion, pest control, orchard productivity and enhancing management efficiency. Planting of hedgerows and fruit tree diversification have been gradually introduced into the productive orchard areas. One of the major problems that has arisen in the last year is the increasing damage caused to fruit by wild mammals especially macaques.

The display area for the new **Constructed Wetland Wastewater Treatment System (CWWTS)** was opened in May to demonstrate how this new treatment system uses natural means to purify and recycle wastewater within KFBG's boundary. While managing the vegetation of the CWWTS to serve the wastewater treatment function, SLA also makes sustainable use of the supply of plant materials in the form of cut-flowers; as mulch for farmland and animal bedding.



Since 2006, chrysanthemum plants have been introduced to the upper orchard areas to diversify production.



Dik and Pui-man, student interns, conducting field-tests to assess the performance of different types of mulching materials.

## 2. Community Programmes

### Waste to Food – Vermi-composting Community Trial Project for processing Kitchen Waste using earthworms

This project is funded by the Environment and Conservation Fund. About 50 households and 4 community groups/institutions took part in a 4-month action-research project (from September 2009) to test application of vermi-composting (earthworm) technology in Hong Kong for processing domestic kitchen waste. Other than the household study project; exhibitions were also organised and leaflets produced for the activities listed in the table below to arouse support for kitchen waste reduction and recovery. The project aroused substantial community interest - it generated 15 media reports and there were over 200 people/organisations on the programme waiting list.

Title of Activity	Nature of Activity	Number of Times Conducted	Number of Participants
Vermicomposting and the KFBG Vermicompost@home unit	Training Course for household participants	2	80
Vermicomposting and the KFBG Vermicompost@home unit	Training Course for community participants	4	100
Ambassador/Volunteer training	Workshop	9	212
Public exhibition and demonstration	Displays and Workshop	9	>6,000

The community trials were very positive and the findings indicated that composting at community level would be far more effective and manageable than at the household level. Future composting programmes will focus on the community level effort and a wider range of technologies other than vermi-composting will also be promoted.

The **LOHAS @ School Programme** (Lifestyle of Health and Sustainability) was well received by 73 participating primary schools in 2009. Through fun-filled activities, the programme engaged students to review their lifestyle and explore more sustainable alternatives. The activities conducted from September 2008 up to July 2009 include the following:

Title of Activity	Nature of Activity	Number of Times Conducted	Number of Participants
Set up an Edible Garden@School	Training course and field-demonstration	40	981
Grow Your Own Food	Workshop	21	10,914
Solar Fun Workshop	Workshop	31	1,500
Waste Reduction DIY	Workshop	33	1,622
Sustainable Consumption	Workshop	7	240
Climate Change and Saving Energy	Talk	30	7,635
Low Footprint Diet	Talk	41	11,262
<b>Total</b>		<b>203</b>	<b>34,154</b>



Ms. Chan, a participant who adopted the vermicompost@home kit at her balcony composting kitchen waste.



Celebrity Ms. Tse Ning and KFBG staff May Cheng conducted a demonstration of vermi-composting at the Star Ferry Central Pier.



Castello Community Farm - one of the participating organisations of the "Waste to Food" vermi-composting community trial programme.



Students "re-think energy consumption" through a solar cooker design workshop.



The OTC campaign website was revamped in mid-2009.

The **One Tonne Challenge (OTC)** campaign has entered its third year. Public commitment has been received to reduce emissions by a total of 18,519 tonnes of carbon dioxide up to the end of 2009. The campaign website ([www.climatechange.hk](http://www.climatechange.hk)) has been revamped to introduce elements of a **Lifestyle of Health and Sustainability (LOHAS)** so as to widen the scope of carbon saving initiatives from direct energy use to food and other aspects of every-day consumption behaviour. The carbon saving tips promoted by OTC has gradually been infused to other campaigns newly initiated by government agencies and private institutions. **Carbon Audit ABC**, **OTC@NGOs** and **OTC@LOHAS** are new programmes that the SLA have jointly developed with the Tai Po Environmental Association specifically for schools, NGOs and gender-specific sectors such as women's groups and associations in order to build capacity in alternative community organisations and to multiply the number of "messengers and change agents" to combat climate change.

In view of the popularity of the OTC Carnival at the Central Star Ferry, SLA has gained support from the Star Ferry (HK) Ltd. to maintain the weekly public education platform at Star Ferry Central Pier and it was re-launched as **LOHAS Square** in April 2009. So far, 12 carnivals have been organised in 2009 with different themes ranging from low-carbon diet to eco-housekeeping in addition to the OTC campaign to arouse public participation for mediating climate change. These activities generated over 70 articles of media reports.

**Farmers' Market** and **Community Supported Agriculture (CSA)** remain the key strategies for SLA to build community support to foster local organic farming. In 2009, a total of 56 Market days were organised by SLA at the Central Star Ferry and at KFBG to provide a stable and equitable platform for over 20 local farmers, food producers and social enterprises. In 2009, the SLA has also offered support to the Tai Po District Council by offering talks and guided visits for elderly farmers to set-up the new "Morning Market" of Tai Po Elderly Farmers.

A talk and a workshop to explore a "road map" for CSA development in Hong Kong was held at the **CSA Symposium** in the Hong Kong Polytechnic University in January 2009. This was jointly organised by SLA, 'Life in Harmony' and five other NGOs and was respectively attended by 120 and 60 people.



1



2



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5

- [1] Over 162,000 eggs, 6.7 tonnes of fruit, 33 tonnes of vegetables and 55 tonnes of compost were produced in 2009.
- [2] The monthly themes of OTC Carnival and LOHAS Square promote carbon footprint reduction through everyday actions in daily life.
- [3] Farmers Market, an important bridge between consumers and producers.
- [4] OTC@LOHAS, a partnership with the Hong Kong Federation of Women to extend the reach of green messages.
- [5] Elderly farmers of the new 'Morning Market' for Tai Po Elderly Farmers visited KFBG in January.

The **Nature Fun Days at KFBG** in 2009 were attended by a total of 8,819 visitors. The programme, organised on the first Sunday of the spring and winter months conveyed conservation messages with themes (developed by various KFBG Departments) which included: *Hakka Festival*; *Ferns, What are we?*; *Discover Our Natural Heritage – Turtles*; *Harvest Festival*; *Forest Killer – Hill Fires*; and *Wild Animals in Traditional Chinese Medicine – Health at a Cost*.

Enabling people to **grow some of their own food** is an important mission of SLA and food growing is a core educational element in sustainable living programmes. In 2009, 2-day **Basic Farming Courses** were organised twice at KFBG. A series of advanced farming courses is planned for 2010. A six-month **GrowFOOD@home** project and a weekly workshop was initiated in December 2009 at the Peak Galleria (on the Peak) for the public to learn how to grow food in the city. The SLA has also been collaborating with the Permaculture Institute Hong Kong to develop a **Good Life Centre** in Sai Kung for running regular courses on permaculture, and advising the Professional Green Building Council on an **Eco-village** design project. In



GrowFOOD@home planting workshop at the Peak Galleria.



Participants taking home pots of edible plants after joining our planting workshops at the 2009 Hong Kong & Shenzhen Bi-city Biennale of Urbanism/Architecture.

addition, our educational and/or advisory service has reached out to 30 other organisations and institutions in Hong Kong and mainland China to promote sustainable living and agriculture in 2009.

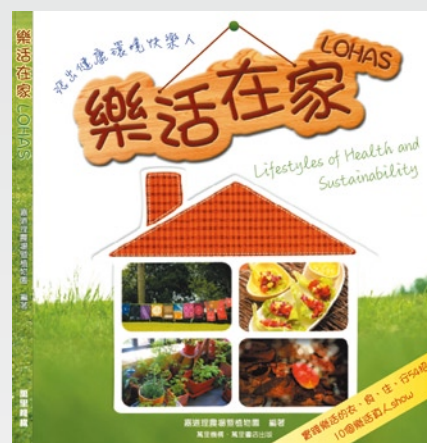
### 3. Collaboration with Universities

- Four animation films featuring the peak oil crisis and one educational film for use in OTC were produced in 2009 through collaboration with the School of Design, COOP programme, of the Hong Kong Polytechnic University. These can be viewed at [www.climatechange.hk](http://www.climatechange.hk)
- Two art pieces were created and displayed at the KFBG Eco-Garden and LOHAS Square at Central (from April to May) to stimulate “rethinking about consumption” in collaboration with the School of Architecture of The Chinese University of Hong Kong.



An artpiece created by CUHK students using waste to stimulate “rethink consumption”.

- A one-day “Transition” Talk for 60 members of the public was jointly organised with Hong Kong Polytechnic University in March 2009.
- A research project to assess the feeding ratio for vermi-composting was undertaken in collaboration with the Hong Kong Institute for Vocational Education.
- A field study of the performance of different mulch materials (mule bedding, green manure, leaves and post-compost wood residues) in terms of moisture retention, weed control, soil fertility and temperature stabilization was undertaken through the City University of Hong Kong’s Industrial Attachment Scheme.



New publications of SLA.

### 4. Publications

In 2009, SLA published a new book, *LOHAS@Home* jointly with Wan Li Book Co. Ltd.; a set of vermicomposting leaflets and an exhibition for public education; and, an educational ‘Carbon Audit ABC’ booklet for use in OTC school programmes.

### 5. Staff Programmes

For staff capacity building programmes, SLA co-ordinated the workshop, *Exploring how meditation can help us increase the awareness of our relationship with the environment?* by Ms. Lea Gonzalez on 30 June; put on six film shows on Peak Oil and Climate Change between April and May; and organised a two-day Transition Workshop by Sophy Bank and Naresh Giangrande of the Transition Network (Totnes) in March 2009. The Staff Garden remains a popular scheme for staff to experience the joys of organic farming.





# CHINA Programme

For many years, the China Programme (CP) has endeavoured to achieve high conservation impact in its work. During 2009, this remained our focus but we have also furthered KFBG's other strategic directions of sustainable living and connection to nature. We begin with our collaboration at Hainan Island's Yinggeling Nature Reserve, where two new management sub-stations (Panyang and Yinggezui) were opened with KFBG funding assistance. Our attempts to integrate conservation with local people's needs and interests have gained recognition from local villagers and government officials and we are now working closely with the Yinggeling Nature Reserve staff to explore awareness-raising opportunities in local communities and schools.



KFBG staff and E'xianling wardens at the foot of the majestic E'xianling Limestone Forest.



Students of Zhongdong Primary School in Guangxi learning about hornbill conservation.

## 1. Building "Conservation Heart" in Hainan

Sustainable farming projects at Daoyin Village, within Yinggeling Nature Reserve, are going well. A new trial of "plastic mulch" on rice fields has led to increased yields and reduced labour for weeding. In the next year, trials will be extended to other nearby villages and the impact on wildlife will also be studied by the nature reserve. We have also begun constructing a "community centre" using sustainable local materials. Having learned a building technique using "rammed-earth" from Auroville, India, Hilario Padilla introduced this simple method, which creates durable buildings similar to the traditional village houses in Hainan. Building their village houses with "rammed-earth" will require much less expenditure and embodied energy than building brick dwellings, while retaining their distinctive graceful traditional building style. Our team worked with a Hong Kong production company

on a documentary film *Daoyin* which describes the outreach and education work in this indigenous community. This film was entered in the Eco-Vision Festival in Palermo, Italy, in June.

The Gaofeng Conservation Community Committee, whose main aim is to promote sustainable resource use in its five component villages (including Daoyin), had its first annual review meeting in October 2009. Yinggeling Nature Reserve allocated funds to support sustainable agriculture and community projects; in turn the



Yinggezui Substation, a paradise for researchers and nature lovers in Yinggeling Nature Reserve, built with KFBG funding assistance.

Committee has clarified its roles and responsibilities, agreed regulations for natural resource use, and set up a monitoring mechanism with simple indicators of conservation success, such as retaining the trees in the Feng Shui Woods, and good frog populations in the fields.

River-ecosystem and fish biodiversity conservation is a major education and conservation theme for the Yinggeling area. In 2009, two new fish sanctuaries were set up, and more local/indigenous communities are asking for help to



Villagers of Daoyin impressed by the improved growth resulting from the plastic-mulch growing technique in their rice fields.



our ambition was to make Yinggeling a demonstration nature reserve. In some ways this has been developing much better than expected, and staff noted for their dedication and initiative are now being asked to train wardens in other nature reserves in Hainan and even Guangxi. A feature of the past year is that dedication is not confined to the core management team. It is also apparent in a growing number of field-based supervisors and wardens, and it has been reinforced by involving some of them in CP conservation projects elsewhere.

On the other hand, much remains to be done. Many wardens are under pressure from members of their own communities to allow illegal activities in the reserve, and continued efforts are needed to reduce these kinds of conflicts. Resource-use conflicts are real, and will not be resolved overnight.

CP's forest management roles are not confined to Yinggeling. During 2009, our consultant, Mr. Li Shining took over as Deputy Director of the E'xianling Limestone Forest Management Office in west Hainan. E'xianling emerged as a significant site of outstanding biodiversity following studies that we commissioned a few years ago. While lack of local government support has prevented the creation of a formal nature reserve at E'xianling, there is still a legal basis for protecting this natural forest and there are wardens employed under the Natural Forests Protection Scheme patrolling the area. Much work is needed to build commitment and initiative among these wardens, some of whom have joined CP activities during the year. New protection stations supported by KFBG are being built to help provide a base for conservation management.

To support reserve managers throughout the southern China region, feedback from the online trial version of the manual *"Sustaining the Pulse – Managing for Biodiversity Conservation in South China's Forest Nature Reserves"* has been used to revise the book. It will be printed in 2010 for distribution to partners and reserve managers.

- [1] People living in harmony with nature at Hongxin Village, Yinggeling.  
 [2] Daoyin Community Centre under construction using a "rammed-earth" building technique.  
 [3] A participatory rescue operation for the endemic and threatened fish, Hainan Garra (*Garra hainanensis*).  
 [4] The school vegetable garden at Yuanmen Middle School.  
 [5] Various awareness-raising activities to engage the nearby schools in Yinggeling.

establish their own fish protection zones along rivers. A fish rescue activity in June released over 300 juvenile Hainan Garra (*Garra hainanensis*), a fish endemic to Hainan with declining populations. This activity raised the conservation awareness of about 400 students from four nearby schools and was widely reported in the Hainan media.

About 20 Yinggeling wardens volunteered to take part in community outreach and education work. In June, we ran a five-day Community and Education Facilitators' Orientation workshop and we will provide further training to those wardens with a natural aptitude as environmental interpreters. A number of Yinggeling staff have already demonstrated their confidence and ability to conduct educational projects. With guidance from CP's Wu Hongyun and others, the reserve has given conservation talks on *Amazing Rainforests* to about 800 students and teachers from four schools. One sub-station, Panyang,

is adjacent to several schools, and we are helping to develop an environmental education centre within it. Yuanmen Primary School has asked for support and guidance to develop environmental education materials.

Following an invitation from officials in Baisha County to showcase sustainable livelihoods in the Yuanmen area, Hongxin Village was chosen for a pilot community project. Since April 2009, staff of CP and Yinggeling Nature Reserve have worked with households to set up various waste re-cycling and eco-agriculture practices. We also introduced the concept of school gardens in Yuanmen Town to plant seeds of sustainability in children's hearts.

## 2. Managing for Biodiversity Conservation

The thorny task of enforcing conservation regulations at Yinggeling has progressed, thanks to the hard work of the staff. From the beginning,

## 3. Species on the Edge

### A. Hainan Gibbon

At Bawangling National Nature Reserve, in Hainan, work goes on to conserve the world's rarest ape, the critically endangered Hainan Gibbon. Monitoring of the largest of the two gibbon groups (Group A) proved difficult from 2008 to 2009 as it shifted its range. CP staff held regular meetings with monitoring teams and Bawangling management, and re-organised monitoring efforts. Months of hard work eventually paid off, with sightings of Group A on the little-known eastern slopes of Futouling. Furthermore, three infants were born during the year in the two groups. We have co-authored a paper arising from Dr. Zhang Mingxia's KFBG Studentship on the gibbons' (declining) habitat availability, and to help prepare for a new international research study (Ph.D.) on the species. Our restored gibbon-habitat forest continues to grow on 150 hectares of land, with additional plantings of several hundred fig-tree cuttings to compensate for losses.



Mr. Mike Cline, a volunteer on the Guangxi Hornbill Conservation Project, teaching students of Zhongdong Primary School, Guangxi.

### B. Oriental Pied Hornbill

A new collaboration in Guangxi with Xidamingshan Nature Reserve and nearby communities aims to safeguard South China's last known population of hornbills, once a familiar sight. These majestic birds, known locally as "aeroplane birds", are important tree seed dispersers across the region. Our former Studentship holder, Dr. Jiang Aiwu (from Hechi College, Guangxi), will study the birds' ecology, while American educator Mike Cline (a Guangdong-based teacher) and Mr. Que Tengcheng (Nanning Zoo) will help with community outreach and education. A hornbill population survey

was conducted in December 2009. At least 41 hornbills were observed, and we estimate about 60 survive. But hunters were active in the reserve, one even admitting that a hornbill was shot a few days before the survey. We are optimistic that local attitudes can be changed, with the enthusiastic involvement of the Director of Xidamingshan Nature Reserve. To begin, an education activity was held at a nearby primary school, and a leaflet on hornbill conservation was produced and distributed to the local wardens and villagers.

## 4. Communicating Conservation

Over 300 copies of CP's conservation magazine *Living Forests* (now ten years old) were produced and sent to our network of partners and colleagues in July 2009. *Living Forests* 15 had a wildlife trade theme, due to the devastating scale of this ongoing threat to biodiversity in South China and beyond. The on-line version was uploaded onto our website ([www.kfbglivingforests.org](http://www.kfbglivingforests.org)) in October and over 1,300 contacts were informed about its availability; tracking software indicated that over 500 people accessed it on the first day. The site now contains

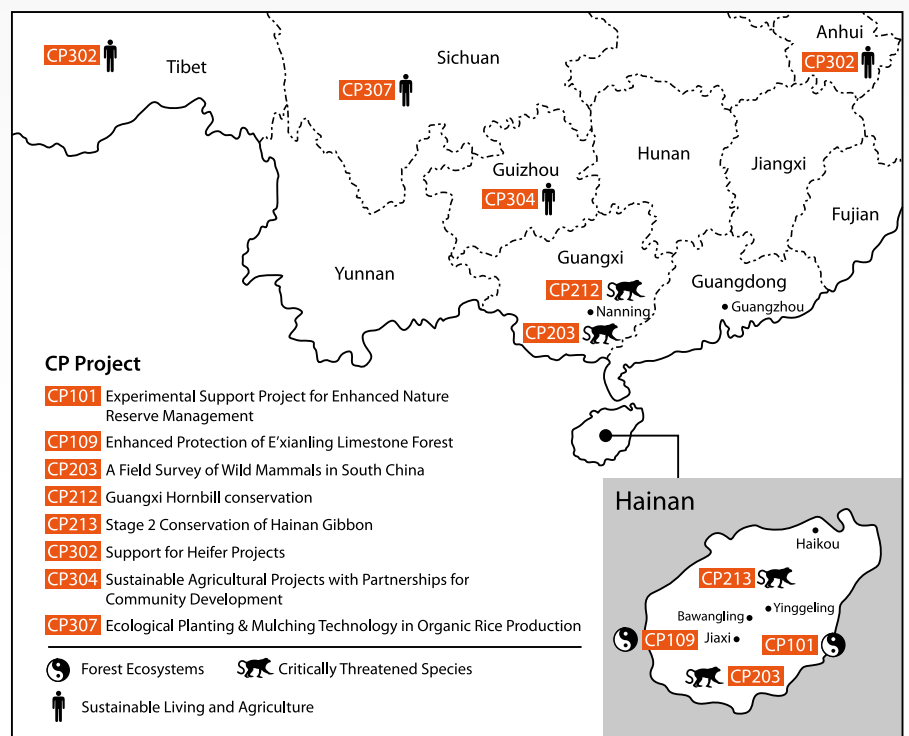
an archive of all back issues, which cover a rich variety of conservation topics.

## 5. Science for Conservation

Yinggeling's new Yinggezui substation functions mainly as a field study centre supporting conservation, research and environmental education activities. The reserve's research and monitoring section became more active during 2009. In April, wardens were trained in the use of camera traps. So far, over 200 photos of various mammals and birds have been obtained through the camera trap survey.

A biodiversity survey of Jiayi Nature Reserve, adjoining Yinggeling in Hainan, was conducted in September by CP staff, Dr. Stephan Gale of KFBG's Orchid Conservation Section and various experts from China. Over 30 people from eight Hainan nature reserves who had been previously trained by CP also joined this survey. The 2009 survey of Jiayi discovered the most extensive area of cloud forest in Hainan, some excellent Guangdong Pine (*Pinus kwangtungensis*) forest, and mature forest extending to low altitudes. It also recorded several orchid species new to Hainan and China.

## Map of Southern China showing the location of China Programme Projects



## 6. Publications

CP members and collaborators have contributed to a number of scientific publications during the year: see *Living Forests* 14 for a full listing. Besides our own publications, we have also been requested to referee conservation papers relevant to our work, for leading journals including *Animal Conservation*, *Biodiversity and Conservation*, *International Journal of Primatology*, *Chelonian Conservation and Biology*, *Oryx* and *Folia Primatologica*.



### Publications from CP work

Title	Authors	Journal citation	Year
Can science in China do more for conservation? (Guest editorial)	*John Fellowes, *Michael Lau & *Bosco Chan	<i>Oryx</i> , Fauna & Flora International, 43(2), 157–158	2009
Discovery of <i>Tanichthys albonubes</i> Lin, 1932 (Cyprinidae) on Hainan Island, and notes on its ecology	*Bosco Chan & Chen Xianglin	<i>Zoological Research</i> 30(2): 209–214	2009
Jinhaku Sonan's skipper type collection deposited at Taiwan Agricultural Research Institute (Lepidoptera: Hesperidae)	Hideyuki Chiba, Yu-Feng Hsu, Hiroshi Tsukiyama, *Philip Yik-Fui Lo, Chien-Ren Chen & Shou-Ming Wang	<i>Zootaxa</i> 2202: 45-58 (2009)	2009
Recent records of freshwater turtles from Guangdong, China	Gong Shiping, Shi Haitao, Jonathan Fong & *Michael Lau	<i>Turtle and Tortoise Newsletter</i> 13: 24-27	2009
Responses to inter-group encounters of the Hainan Gibbon <i>Nomascus hainanus</i>	Zhou Jiang, *Bosco Chan & Wei Fuwen	<i>Zoological Research</i> 29(6): 667-673	2008

(\*CP staff)

## 7. KFBG Studentships

The following awards were made for the 2009-2010 KFBG Studentships.

Name	Degree	Institution	Topic
Gan Weiping	M.Phil	South China Agricultural University	A Preliminary Study on the Effects of Afforestation in Habitat Restoration for Hainan Gibbons in Bawangling
Huang Liuqing	Ph.D.	South China Botanical Garden, CAS	The response of biodiversity in evergreen broadleaf forest to urbanization pressure
Ren Haiqing	M.Phil	Hubei University	Spider diversity in rubber and natural forest in Hainan
Wang Jishan	M.Phil	Kunming Institute of Zoology, CAS	Ecology of Yunnan Box Turtle <i>Cuora yunnanensis</i>
Zhong Jie	M.Phil	Institute of Botany, CAS, & Northeast Normal University	Role of Oriental Pied Hornbill in seed dispersal and forest recruitment in southwest Guangxi



Improving the welfare and nutrition of pigs in Tibet with Heifer.

## 8. Training for Sustainable Agriculture

CP has been providing expert advice on ecological agriculture for a number of projects. For example, Hilario Padilla visited Anhui and Tibet to help Heifer International train farmers and officials in

livestock methods based on ecological sustainability and animal welfare. Heifer has now published some "*Animal Well-being Suggestions*" for their projects based on KFBG's guidance.

Hilario also advised 'RARE Conservation' in their work. One of their projects is at Baimashan Nature Reserve, Yunnan, the habitat of the Yunnan Snub-nosed Monkey. The main threat to the reserve is fuel wood collection, about 40% of which was to cook pig feed. Hilario trained the local villagers on the use of uncooked pig feed, on how to compare this with cooked feed, and on how to grow high-protein, less fibrous forage crops that are adapted to these high elevations.

## 9. Science for Sustainable Agriculture

KFBG supported Prof. Lu Shihua of the Sichuan Academy of Agricultural Sciences, inventor of the plastic mulch technique in rice farming, to undertake production trials of his methods under organic conditions. Trials with rice-duck, rice-fish, and rice-fish-duck systems were conducted in five different locations and dramatically increased rice yields.



Prof. Lu Shihua and one of his plastic-mulch trial plots for rice cultivation in Anlong Village of Pi County, Sichuan.

# General ADMINISTRATION & Facilities

Overall expenditure for KFBG increased by 2%. This is comprised of an increase in both operating expenditure and on capital items. When compared with 2008, the total number of visitors to KFBG in 2009 decreased slightly by 0.6%. Farm shop sales, however, have increased by 5%. This was mainly due to the increase in the variety of organic products offered for sale and people's increasing awareness about the need for environmental protection and to be more mindful about looking after their health.



The 15<sup>th</sup> Kadoorie Brothers Memorial Race was held on 20<sup>th</sup> December, 2009 – 231 participants joined this special farm event.



Tree Planting at KFBG on Earth Day (22<sup>nd</sup> April, 2009).

## 1. Accounting & Finance

Expenditure (HK\$)	2008 (audited figures)	2009 (unaudited figures)
Operating	57,821,243	59,258,000
Capital	20,973,041	21,176,000
<b>Total</b>	<b>78,794,284</b>	<b>80,434,000</b>

## 2. Number of Visitors to KFBG

2008	2009	Percentage change (+/-)
130,643	129,847	-0.6%

## 3. Shop Sales

2008	2009	Percentage change (+/-)
HK\$1,477,899.10	HK\$1,554,434.40	+5%



Andy Brown, Executive Director giving a talk at the KFBG Annual Spring Dinner 2009.



During the year, a wider range of organic products have increased sales in the farm shop by about 5%.

#### 4. Security, Occupational Health & Safety

In 2009, there were a total of 61 incidents recorded, of which 24 cases were related to injuries while on duty and 7 cases required sick leave of more than 3 days. There were 24 minor accidents related to farm vehicles; 4 cases of theft and loss of property; injuries to 4 visitors and 5 miscellaneous incidents.

#### 5. Facilities

##### A. Water Quality & Waste Disposal Improvements

Following the commissioning of the KFBG wastewater wetlands in November 2008, new elements incorporated as part of the system are connection to the public toilets to re-use the treated waste water for flushing purposes and a new pond that was added to the educational display area in June 2009. The new sewage conveyance system for the toilets in the Conservation Building was also connected in May 2009. Consequently, most of the sewage collected from the lower farm is now being treated by the wastewater wetland treatment system.



A new pond at the Constructed Wetland Wastewater Treatment System.



Sterilization system for re-circulation of treated waste water.

##### B. Geotechnical Assessment & Upgrading of Slopes

During 2009, stabilization work to the slopes at the Wild Animal Rescue Centre and the Mules Stable area were completed. In addition, on-going routine inspections and preventive maintenance works were carried out on various slopes and retaining walls around the farm.



Stabilization of slope behind the Chicken Houses.

##### C. Building Developments & Renovation

In May 2009, the Government Water Supplies Department approved our application for the provision of government water supply up to the KFBG boundary. We had to install our own sumps and machinery in order to be able to pump government water from the boundary to the Farm cafe. The construction of a new water pumping station and ancillary pipe works were eventually completed and the connection of water supply by the Government to our pumphouse was completed by the time of writing this report.



Stabilization of slope behind Mule Stables.



Exterior view of the new Café Kiosk.



Interior view of the new Pumping Station for water supply from the Water Supplies Department.

Other major capital projects completed during the year included the renovation of the offices on the first floor at the Conservation Building (our main office area), refurbishment of the Kwun Yum Garden Building, renovation of the Monkey Haven enclosure and associated facilities, the development of the Horticultural Therapy Garden and the roof garden at the Insect House. In 2009, a total of 1,799 requisitions for repairs and maintenance were completed during the year.

## D. Resources Management & Sustainability

- In July 2009, we implemented the use of bio-diesel from waste-cooking oil (B20, 20% bio-diesel and 80% petroleum diesel) for two Farm vehicles on a trial basis. The Sustainable Living and Agriculture Department has also started to use B5 (5% bio-diesel) from October 2009 as an energy source for their power tools and farm machinery.
- A drinking water system using the principle of Reverse Osmosis was installed in early August 2009 to provide drinking water from our stream to the General Administration Department offices on a trial basis. In order to achieve the target of using no plastic-bottled water inside the Farm, similar machines along with pre-filtration and UV sterilization systems will be installed around the Farm for visitors, staff and volunteer use as from 2010.
- An installation for a 1kW grid-connected photo-voltaic (PV) system to supply power for the Veterinary Hospital, and, a 4.8kW grid-connected PV system on the roof of the Conservation Building to supply power for our main office area were completed in 2009. The Grid-connection applications for both systems were approved by China Light and Power on 23<sup>rd</sup> November, 2009.



The newly renovated Kwun Yum Garden Building.



A view of the renovated Monkey Haven enclosure.



Photo-voltaic panels installed on the roof of the Conservation Building.

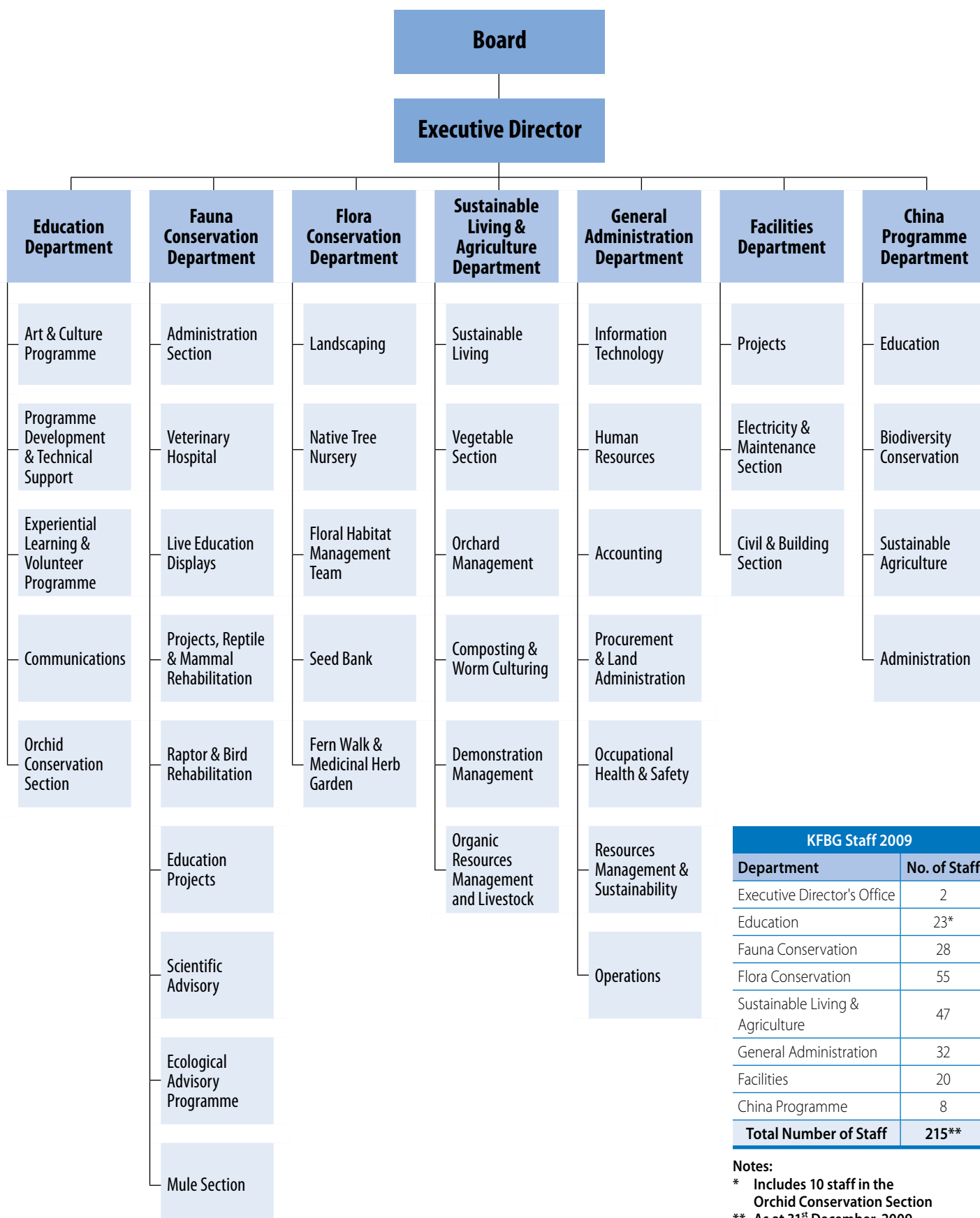


Photo-voltaic panels installed on the roof of the Veterinary Hospital.



Insect House Roof Garden.

# KFBG Organisation



KFBG Staff 2009	
Department	No. of Staff
Executive Director's Office	2
Education	23*
Fauna Conservation	28
Flora Conservation	55
Sustainable Living & Agriculture	47
General Administration	32
Facilities	20
China Programme	8
<b>Total Number of Staff</b>	<b>215**</b>

**Notes:**

\* Includes 10 staff in the Orchid Conservation Section

\*\* As at 31<sup>st</sup> December, 2009



# Members of the Board

## of the Kadoorie Farm and Botanic Garden Corporation

***Andrew McAulay (Chairperson)***

***Ian D. Boyce***

***Dr. Lawrence Lee***

***Ruy Barretto, S.C.***

***Ho Wai Chi***

***Deborah Whittle***

***Daniel R. Bradshaw***

# Senior Management

## of the Kadoorie Farm and Botanic Garden Corporation

### Executive Director

***Andy Brown***

### Heads of Department

China Programme

***Dr. Michael Lau***

Education Department

***Dr. Chiu Sein Tuck***

Facilities Department

***Denis Ng***

Fauna Conservation Department

***Dr. Gary Ades***

Flora Conservation Department

***Dr. Charlotte Shiu (Acting Head)***

General Administration Department

***Florence Au***

Sustainable Living & Agriculture Department

***Idy Wong***



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