

# Kadoorie Farm & Botanic Garden

ANNUAL REPORT 2010



To harmonise our relationship with the environment

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## **Kadoorie Farm and Botanic Garden Annual Report 2010**

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# ABOUT KFBG

Kadoorie Farm and Botanic Garden (KFBG) is situated in the rural New Territories, on the northern slopes of Tai Mo Shan, Hong Kong's highest mountain. Two steep spurs enclose its deep-set valley. Within KFBG are streams, woodlands, orchards, vegetable gardens, walking trails, live animal exhibits, floral exhibits, sustainable agriculture demonstration plots, art exhibits, a wild animal rescue centre, a native tree nursery, and, other conservation and education facilities.

In the post-war years, Hong Kong was flooded with destitute immigrants. Many had traditional knowledge of crop production and livestock farming but no stock, others had land but no experience. They required support to rebuild their lives. In 1951, in response to these pressing human needs Lawrence and Horace Kadoorie established the Kadoorie Agricultural Aid Association (KAAA), which became a key partner of the Hong Kong Government in devising and implementing a plan to help Hong Kong feed itself. The Kadoorie brothers, part of a well-established business family, saw wealth as a sacred trust to benefit mankind. With such aid, thousands of people received agricultural training; thousands of pigs, chickens and ducks were bred and given to farmers or sold to them on credit; thousands received micro-loans; and numerous wells, irrigation channels, roads, footpaths, bridges, pigsties and farm houses were built. The farm site at Pak Ngau Shek was established in 1956 as a base for livestock breeding and distribution, agricultural research, farmers training, public education and recreation. The barren slopes were terraced and planted with orchards and vegetable gardens. The development of the botanic garden began in 1963 and the plant conservation programme from 1972.

On 20<sup>th</sup> January, 1995, the Legislative Council of Hong Kong passed an Ordinance (KFBG Chapter 1156) incorporating KFBG as a non-profit corporation designated as a conservation and education centre. It is a unique public-private partnership, for while the KFBG Corporation is a public organisation, it is privately funded by the Kadoorie Foundation (some HKD 90 million per year); these funds are supplemented by small donations from the public and occasional project-related Government grants that enable us to extend our work.

Since 1995, KFBG has been conducting a wide range of nature education, nature conservation and sustainable living programmes both on-site, and, throughout Hong Kong and South China.

In 2010, a time of severe global crisis – including the inter-related issues of widespread disconnection from nature, each other and self; the ever-increasing exploitation of, and unwise over-reliance on the world's dwindling resources to support unsustainable lifestyles; climate change; shrinking of natural habitats and species loss – KFBG, as an organisation, raises awareness, undertakes rigorous science-based species conservation and ecosystem restoration, and offers new ways of thinking and living to respond to the world's problems. Hence, our work brings hope and improvement by focusing on nature conservation, sustainable living and holistic education that re-connects people with nature. By working together with the public, Governments, academia, NGOs and businesses, we can protect our common future.



# MISSION & VISION

## **MISSION**

To harmonise our relationship with the environment.

## **VISION**

A world in which people live sustainably with respect for each other and nature.

## **VALUES**

### **Sustainable Living**

Appreciating the impact of our actions with regard to current and future generations. Having awareness of our connection with the environment. Valuing simple and responsible lifestyles.

### **Justice**

Being fair and accountable. Valuing socially equitable systems that protect the health of the planet, the people and their way of life. Protect future generations.

### **Love**

Having self-awareness and understanding of the inter-relationship of all things. Having compassion and respect for all life. Recognising that outer discord is a reflection of inner discord. Striving for inner silence.

### **Participation**

Engaging mentally, physically, emotionally and spiritually; fostering respect for different viewpoints, openness, dialogue and teamwork.

### **Professionalism**

Being a role model of caring, integrity, commitment, professional standards and best practices for partners, organisations, individuals and communities.

### **Learning**

Being adaptive and flexible to changing circumstances. Having a holistic outlook. Being practical, objective, creative and insightful.

### **Happiness**

Appreciating that our happiness lies in creating and sharing happiness with others.

# CHAIRPERSON'S MESSAGE

***The following is extracted from the speech of the Chairperson of KFBG at the Annual Dinner, of February 2011.***

I believe that we are all privileged to be living at a momentous time in the Earth's history. It is a time of global crisis. All our systems – financial, economic, social and ecological – are being stretched to their limit and there are many signs that they may be close to the point of collapse.

The way I understand it, what we see happening around the world, when we turn on the news, is a reflection of what is going on inside us. We are brought up to believe that we are separate from each other – and that happiness and fulfillment are to be found by improving our status in society and accumulating wealth and possessions. Yet experience teaches us that this kind of happiness does not last long... and many people are growing increasingly desperate.

Meanwhile, our understanding of the world is evolving – science is discovering things that have long been known intuitively in spiritual traditions. For example, Physics has discovered that, at the quantum level, the way particles behave depends on our perception. This is very similar to what we can read in the Indian scriptures, where it is stated that "The world is as you see it".

Quantum Physics has also established that all matter consists of one universal energy – echoing the Western religions, which state that there is one God... and the science of Ecology has discovered that everything is interrelated – which is what Buddhism teaches with the concept of "Inter-being".

So the question more and more of us are being faced with is: If everything is a part of us, then why don't we experience that? Why do we still feel separate and act selfishly?

I recently watched a YouTube video talk by a neuroscientist. In it he said studies have shown that certain parts of the brain are associated with feelings of love and compassion and unselfish behaviour – and these parts of the brain can be activated through contemplation exercises: reflecting on who we are and on the nature of the world. He concluded that it is not a question of morality – of there being good and bad people – but rather it is quite scientific: the way we see and understand the world determines very naturally how we feel and act.

At KFBG, the challenges that we face ultimately require that each of us do this kind of contemplation. Whether we are trying to conserve nature, create sustainable structures or educate people, sooner or later we discover – as Einstein said – that we cannot resolve the world's problems with the same kind of thinking that created them.

We are on the cutting edge of a momentum that is being experienced by communities all over the world. As our old way of understanding gives way, so do the systems which that way of understanding created – and as those systems collapse, we are being forced to consider a new way of living that will reflect a new way of understanding the world.

I believe that these two processes, inner and outer, go together – and that it is an accelerating process. It will be painful at times, but it can also be joyful when we recognize what is going on and participate. As the Chinese term for crisis suggests, with danger comes opportunity – and KFBG offers us all the opportunity to participate.

In the last year we have taken some great steps forward – in particular by finalizing a new strategy that reframes all that we are doing in a more integrated way and allows us all to work more closely together.

In the area of Nature Conservation, we are broadening and deepening our overall focus to include the Indo-Burma hotspot – the region which Hong Kong is a part of, that shares the same groups of fauna and flora. Meanwhile in Hong Kong, we are getting busier and busier fighting to protect our beautiful countryside from being degraded. Our work in Mainland China is also evolving and includes the recently launched ‘Sustainable Agriculture Pioneers Scheme’.

In the field of sustainable living – or Transition, as we now call it – we have been awarded a new site by the Hong Kong Government, under its “Revitalizing Historic Buildings Through Partnership Scheme”. We will be turning the Old Tai Po Police Station into a Green Hub for the Tai Po community and a place of learning, for people and communities all over Hong Kong and the region.

Our education programme is acquiring greater depth as we integrate components that encourage people to spend more time in nature, in silence, cultivating their intuitive wisdom and joy. In this connection, towards the end of this year, we will once again be hosting Satish Kumar, who will lead a retreat and deliver talks to the public.

Of course, at the heart of all our work is our magical and beautiful site – so I want to acknowledge the efforts of all our administration and facilities staff and all our workers, who maintain and look after the buildings and gardens.

In the coming year, amongst other things, we will finally be opening the Farm café. After many years of struggle, we have now obtained the Occupation Permit and should soon be getting the license. This means tasty vegetarian snacks available at all hours of the day!

We will also be upgrading offices and completing new laboratories. We will be opening a new orchid theme garden, to be named after Gloria Barretto – and unveiling a sculpture of our founder, Horace Kadoorie, who I am sure would be very proud to see how the Farm is evolving.

In fact, I think each one of us can be proud of the Farm – it is quite astounding when you step back and look at all our programmes as a whole and see how much ground we are covering. No one’s work is more important than anyone else’s – each person plays a part and shares in the success of the whole.

So, from the bottom of my heart, I want to thank all of you who are embracing this work – staff, volunteers, partners, friends... Your wisdom and enthusiasm is truly inspiring.

**Andrew McAulay**

# SUSTAINABLE LIVING

The KFBG Goal for Sustainable Living is: "Steady progress towards living within natural limits. An expanding, maturing network of groups and individuals working towards community resilience and sustainable living. Improving community cohesion and preparedness for Peak Oil and Climate Change."

*In 2010, KFBG made great strides in facilitating Hong Kong's transition to sustainable living, through exhibitions and public*

*workshops, engagement campaigns on carbon reduction, and training in sustainable agriculture and low-carbon living. We have helped to run Farmers' Markets, and advised on integrating community farms into Housing Authority estates. A highlight of the year was winning the opportunity to turn the Old Tai Po Police Station into a Green Hub to promote sustainable living in the community, a focal point for a positive future. We have also supported globally-important research on reducing methane emissions from rice, through our new Sustainable Agriculture Pioneers scheme.*

## Raising Public Awareness

During 2010, we organised a wide range of exhibitions and public workshops to raise awareness of Peak Oil (the point at which the global production of oil peaks and starts to decline irreversibly, causing shortages of supply and high prices) and Climate Change. On 26<sup>th</sup> November, the Executive Director gave a talk, supported by a paper, to the Legislative Council stressing the need to integrate Peak Oil preparedness into Climate Change adaptation and mitigation plans. In our **Sustainable Living and Agriculture Department**,

food remains our core entry-point for the basis of our work. We have highlighted the urgency and steps required to switch from an import-based to a more localised food production system. Our contribution to the Hong Kong Flower Show 2010 took the theme **Local Food, Future Solution**, under which our volunteers introduced KFBG's mission and programmes to some 500,000 visitors. Our exhibits at various venues around Hong Kong demonstrated that city farming could be highly productive and multi-functional in enhancing the city's social integration and recreational opportunities.



Hong Kong Flower Show 2010 – KFBG display at Victoria Park.

Awareness-raising exhibitions organised in 2010:

Title	Period	Venue	Visitor flow (estimated)
<b>Local Food, Future Solution*</b> at the Hong Kong Flower Show 2010	19 <sup>th</sup> - 28 <sup>th</sup> March, 2010	Victoria Park	>500,000
<b>growFOOD@home at the Peak</b>	December 2009 - April 2010	Peak Galleria	>30,000
<b>growFOOD@home at Central</b>	June - December 2010	Central Star Ferry Pier	>50,000
<b>LOHAS Tai Po, growFOOD@home</b>	October - December 2010	Tai Po Public Library	>20,000

\* Featuring layout and signage designed by the KFBG Education Department.

Public workshops and talks organised in 2010:

Topic	Date and number of workshops	Venue	Number of participants (estimated)
<b>growFOOD@home workshop</b>	January - April 2010 (105 workshops)	Peak Galleria	>3,000
	15 <sup>th</sup> August, 2010 (1 workshop)	Tseung Kwan O Public Library	>50
	22 <sup>nd</sup> August, 2010 (1 workshop)	Sai Kung Public Library	>50
	October - December 2010 (6 workshops)	Tai Po Public Library	>300
	January - March 2010 (2 days)	Bi-city Biennale Exhibition of Design & Architecture at Kowloon West Waterfront area	>300
	17 <sup>th</sup> October, 2010 (1 day)	Fung Yuen Butterfly Nature Reserve	>1,000
	28 <sup>th</sup> November, 2010 (1 day)	Tai Po Farmers' Market	>400
<b>LOHAS<sup>1</sup> Workshop</b>	January - December 2010 (25 workshops)	At various venues provided by Government departments, corporations and NGOs for staff training or for public education	>2,000

<sup>1</sup> **LOHAS** = "Lifestyle Of Health And Sustainability"

Carnivals and/or public events organised in 2010:

Topic	Number of days	Venue	Number of participants (estimated)
<b>LOHAS Square</b>	7 days	Central Star Ferry Pier	>6,000

This year, the on-going **One Tonne Challenge (OTC)** campaign, co-organised with **Tai Po Environmental Association (TPEA)**, expanded from participation by uniformed youth groups to other sectors of youth organisations in Hong Kong. The **Carbon Audit ABC** programme reached 7,000 students involving 22 primary schools by June, and the **OTC@LOHAS** projects had reached 50 non-governmental organisations (NGOs) by August 2010. The project **LOHAS Tai Po – An Energy-Wise and Carbon Reduction District**, initiated by TPEA and supported by KFBG, was launched in mid-2010, to promote energy-saving using a district-based approach. The OTC website was revamped to accommodate new interactive components for effective learning. By the end of 2010, the website had a cumulative hit count of 438,478, and had received reduction pledges totalling 26,551 tonnes of carbon dioxide by far-sighted members of the public.



**One Tonne Challenge Opening Ceremony at the Star Ferry Central Pier.**



**LOHAS@Youth Square – Opening Ceremony at Chai Wan.**



## Re-skilling for Sustainable Living

A series of re-skilling programmes were developed in 2010 to facilitate the public's active participation in transition to low-carbon living. New programmes included the popular **Training Courses in Sustainable Agriculture for City Farmers** launched in April and a 12-day **Permaculture Design Certificate Course** held in December. These aim to engage local people to act to shift Hong Kong's import-based food system towards a more localised and sustainable food production system.



Participants of the City Farming course at KFBG.

Course title	Date	Number of courses	Venue	Number of participants
Two-day Training Course in Sustainable Agriculture for City Farmers	April - November, 2010	4	KFBG	80
One-day Advanced Course in Sustainable Agriculture for City Farmers	25 <sup>th</sup> July & 17 <sup>th</sup> August, 2010	2	KFBG	42
Community Farming Course for Beginners	26 <sup>th</sup> November, 2010	1	KFBG	47
12-day Permaculture Design Certificate Course	14 <sup>th</sup> - 27 <sup>th</sup> December, 2010	1	KFBG, Kadoorie Institute Shek Kong, and the Hong Kong Polytechnic University	51 graduates, and 7 observers



A group photo of the graduates of the Permaculture Design Certificate Course taken at the Kadoorie Institute, Shek Kong.



Dr Mu Jun (of the Chinese University of Hong Kong) discussing eco-housing with participants of the Permaculture Design Certificate Course.



Nature Fun Day at KFBG – a planting workshop.



Dr Kitty Poon, Under-Secretary for the Environment and Mabel Mak, Honorary President (Hong Kong Federation of Women), demonstrate low carbon cooking.



We continued our collaboration with universities to enrich students' learning and participation in Sustainable Living. In a joint initiative with the Chinese University of Hong Kong (CUHK) and the Permaculture Institute Hong Kong, over 30 CUHK architecture students were engaged in a four-month design project, featuring the design of a **Good Life Centre** for teaching permaculture. Tours at KFBG were also organised as part of the City University of Hong Kong (CityU) **Sustainable Cities for the 21<sup>st</sup> Century** course, for 52 students. We continued our collaboration with the School of Design (Hong Kong Polytechnic University), **Co-operative Workshop** project, and 15 design students were engaged this year to design education materials for low-carbon living. Two student interns were engaged through CityU's Industrial Attachment Scheme to conduct trials on making bio-charcoal. Another one-year internship was arranged for a student of Imperial College, London University to conduct research on vermicomposting (worms) at KFBG.

In Mainland China, ecological design workshops were also conducted at Yinggezui Substation, Yinggeling Nature Reserve, Hainan, where teachers from the Yuanmen community and interns from Partnerships for Community Development learned how to use kitchen waste and leaf litter as fertilizer for crops.



A display of the growFOOD@home public workshop at KFBG.



Sustainable Agriculture Course for City Farmers at KFBG.



Nature Fun Day at KFBG – a planting workshop.



LOHAS@Youth Square – KFBG Exhibit at Chai Wan.



Waste to Resource Workshop – recycling of cloth.



## Facilities Supporting Sustainable Living

Following its success in previous years, the Lands Department and Star Ferry Hong Kong Limited kindly granted approval for our continued use of the Star Ferry Central Pier (Platform No. 7) on Sundays to run the weekly **Farmers' Market @ Central** and monthly **LOHAS Square Carnival** in 2010. A total of 50 market days and seven days of educational carnivals were organised at this venue involving seventeen local organic farms and ten NGOs reaching tens of thousands of people in the year.

KFBG was also invited by the **Housing Authority (HA)** to assist in the planning of community farms at its existing and new housing estates. Three half-day programmes were organised in September and October for over 50 HA architects, engineers and landscape architects to explore the multiple functions of community farming and to be briefed about KFBG's models for organic resource recovery. We also assisted the HA to conduct a community engagement workshop on 9<sup>th</sup> October for community stakeholders to envision an **Open Public Space** at Kwai Shing Circuit. Meanwhile, the KFBG **Education Department** was invited by the **Neighbourhood Advice-Action Council (NAAC)** to assist with the planning and development of a community garden for their disabled service users, at their existing residential-cum-workshop facilities at **Harmony Manor** (Sha Tin).

Working with TPEA, we assisted with the design and volunteer training for a new **LOHAS @ Youth Square** Education Centre at Chai Wan for public education. The centre was opened in November 2010 and will help members of the public and school groups learn about how to live a **lifestyle of health and sustainability**.

Adapting to Climate Change will call for improved understanding of climate trends. In June, we arranged for the installation of an **Automated Weather Station**, operated by the Hong Kong Weather Observatory, in the middle hillside at KFBG. This extends the network of weather monitoring stations in Hong Kong and will improve the provision of timely regional weather information to the Hong Kong community.



An overview of the Farmers' Market@Central Star Ferry.



Hakka Festival at LOHAS Square.



Automated Weather Station installed by the Hong Kong Observatory at KFBG.

## Mobilising the Community

Considerable effort was devoted to building the capacity of community organisations and partnerships for Sustainable Living as indicated in the activities listed in the following table.

Capacity-building programmes organised for partner organisations:

Partner organisation	Date	Programme title	Location	Number of participants
<b>Partnerships for Community Development (PCD)</b>	17 <sup>th</sup> & 21 <sup>st</sup> January, 2010	Internship Training	KFBG / Farmers' Market @ Central	>10
	23 <sup>rd</sup> - 27 <sup>th</sup> August, 2010	Eco-Village Design Workshop	Guizhou	>25
	13 <sup>th</sup> October, 2010	Internship Training (Sichuan)	KFBG	>10
	24 <sup>th</sup> November, 2010	Internship Training (Yunnan)	KFBG	>10
<b>Permaculture Institute Hong Kong</b>	30 <sup>th</sup> January, 24 <sup>th</sup> & 30 <sup>th</sup> March, 2010	Sustainable Agriculture	KFBG	>20
<b>Business Environment Council</b>	3 <sup>rd</sup> March, 2010	Holistic Alternatives for a More Sustainable Future	Central	46
<b>Greenwise Workers' Co-operative Society</b>	20 <sup>th</sup> April, 2010	Staff Training	KFBG	15
<b>Rotary International</b>	27 <sup>th</sup> April, 2010	Alternate Food System	KFBG	>20
<b>Hong Chi Association</b>	11 <sup>th</sup> June & 14 <sup>th</sup> July, 2010	Sustainable Agriculture and Tree Safety Assessment	KFBG / Hong Chi Pinehill Village	14
<b>Staff of Yinggeling Nature Reserve, Hainan and teachers of Yuanmen Schools</b>	12 <sup>th</sup> - 16 <sup>th</sup> June, 2010	Eco-literacy and Ecological Design	Yinggeling	24 plus 45 Hainan Normal University students for one day, appreciating nature and Peak Oil / Climate Change sessions
<b>Ngong Ping Tea Garden</b>	21 <sup>st</sup> October, 2010	Tea Production and Management	KFBG	>10
<b>Sustainable Ecological Ethical Development Foundation (SEED)</b>	30 <sup>th</sup> October, 2010	Farming Course	Kam Tin	>20
<b>Catholic Messengers of Green Consciousness</b>	3 <sup>rd</sup> November, 2010	Harmonise our Relationship with Nature	Wong Tai Sin	>40
<b>The University of Hong Kong (HKU): MSc in Environmental Management</b>	18 <sup>th</sup> November, 2010	Peak Oil & Climate Change; Principles of Transition & Permaculture	HKU, Pokfulam	~25
<b>Partners of KFBG China Programme and 'Partnerships for Community Development' in Sichuan and Yunnan</b>	13 <sup>th</sup> & 24 <sup>th</sup> November, 2010	Strategies for sustainable agriculture and transition in response to Peak Oil & Climate Change	KFBG	20
<b>Peaceful Women</b>	9 <sup>th</sup> December, 2010	Sustainable Agriculture	KFBG	35



Funded by the Environmental Protection Department, a **LOWcarbonDIET@home** project, co-organised with the **Hong Kong Federation of Women (HKFW)**, was launched in December to train 300 low-carbon ambassadors of HKFW's member organisations in different districts to promote transition to low-carbon living. These ambassadors' initiatives for community education will be documented and published for wider use.

Funded by the Environment and Conservation Fund, a ten-month pilot project to explore the feasibility of community **food-waste recycling through vermicomposting (worms)** was completed in April. With an emphasis on food-waste reduction, the project's educational activities reached over 11,000 people and recycled 5.8 tonnes of food waste from urban housing estates.

Apart from provision of staff training, seed money amounting to HK\$99,756 was provided to **Greenwise Workers' Cooperative Society** to help this community-based social enterprise develop a business plan for their recycling business – making soap from waste cooking oil.



growFOOD@home exhibition and workshop at the Peak Galleria, Hong Kong Island.



Launching ceremony of the LOWcarbonDIET@home project.



Workers of the Ngong Ping Tea Garden (on Lantau) visiting KFBG.



growFOOD@home exhibition and workshop at the Peak Galleria, Hong Kong Island.



Eco-village training at Guizhou conducted by staff of our China Programme.



## The Green Hub

In September, KFBG was awarded the opportunity to use the Old Tai Po Police Station as a Green Hub for promoting sustainable living, under the Development Bureau's 'Revitalising Historic Buildings through Partnership' scheme. We thank the Secretary for Development, Ms Carrie Lam, the Development Bureau of the Hong Kong SAR Government and the members of the scheme's Selection Board for putting their trust in us and providing us with this wonderful and historically significant site as a vehicle for our work in the community. It took hard work to win this bid but the real work starts now. The Green Hub will play a key role in KFBG's strategy to facilitate Sustainable Living. It will serve as a base for re-skilling and mobilising the local community for change to low-carbon lifestyles, as well as being a learning centre for transformative education and professional training on sustainable living for community leaders, educators and professionals in the region. We will also set-up a vegetarian cafe, a farmers' market, a community-market, an historic exhibition, and organise art events, and guided tours of the site, as well as the surrounding sites of historical significance. There is a series of formal consultations, tendering and Government-funding application procedures ahead of us with an 18-month renovation scheme scheduled for 2012-2013, and the Green Hub is expected to open in late 2013.



Media briefing at the Green Hub.



Artist's impression of the central courtyard at the Green Hub after restoration.

Working Demonstrations of Sustainability

At KFBG, we constantly strive for more effective cycling of resources. In late June, we installed a **bio-charcoal-making kiln** at the KFBG site, as a new measure to recover wood waste as a resource. Upon completion of a two-month trial and laboratory testing of the product, the kiln was put into active use and it has converted 2.2 tonnes of wood waste into 350 kg of bio-charcoal by the end of December. Trial use of the bio-charcoal for soil quality improvement in our vegetable gardens and for planting orchids is in progress. The technology has high potential for adoption as a means for organic resource recovery and waste reduction in local urban parks.



Biochar kiln at KFBG.

In 2010, the following types of agricultural products were produced at KFBG:

Type of produce	Fruit tree seedlings	Potted plants	Compost (kg)	Eggs	Fruit (kg)	Vegetables (kg)	Honey (litres)	Green tea (kg)	Chrysanthemum (kg)
Yield	250	2,248	44,880	172,716	6,649	31,644	36.3	28	9

Our Farm Shop contributes to our Sustainable Living programme. Overall shop sales were similar to 2009, with an increase in the sales of fruit. The biggest-selling items included organic snacks and drinks, vegetables and our farm eggs. Vegetable demand was highest when families visited at weekends. A drop in souvenir sales reflects a reduction in crafts made from Farm-supplied wood, a natural resource which is dependent on storm damage and the resulting availability of wind felled trees.

A summary of income from sales of items at the Farm Shop

Sale items	2009 (HK\$)	2010 (HK\$)
Vegetables	298,018	304,032
Plants	32,290	34,950
Farm eggs	231,954	234,390
Fruits	53,085	74,073
Organic snacks & drinks	663,411	633,933
Publications	85,567	74,350
Souvenirs	21,214	12,344
Others	168,324	191,558
Total	1,553,863	1,559,630



Seedlings of edible crops for sale at the KFBG Farm Shop.



Agroforestry terrace at KFBG.



An example of signage in the Eco-garden at KFBG.



School children visiting the Eco-garden at KFBG.



In mainland China, we have continued to work on developing systems to demonstrate sustainable agriculture and resource utilisation. In early 2010, our China team helped the **Chinese Culture Promotion Society** set-up a demonstration 'eco-household unit' at a former school building at **Qinmo Community Centre**, in Quaji County, Guangdong. The Centre provides educational support to Qinmo Green School, built by the Hong Kong Green Hope Foundation. We contributed by building a deep-litter pig rearing pen, and, a deep-litter-bedding system for rearing chickens as well as a kitchen garden, and providing training on the use of these facilities as part of the centre's waste recycling system.

In March, we launched our **Sustainable Agriculture Pioneers (SAP)** Scheme, to support innovative research that addresses fundamental challenges in sustainable food systems. The choice of the inaugural theme, **Rice and Climate Change**, reflects the outstanding importance of rice production systems, globally, in meeting both food demands and regulating atmospheric gas concentration, especially in terms of methane emissions. Five projects were selected for study of the effects of different types of organic rice-farming methods on the generation of methane emissions to the atmosphere; and, in May, a seminar was organised to launch the scheme at the South China Agriculture University, Guangzhou.

Some of our on-going research projects on sustainable agriculture have shown much promise especially the field trials using **plastic mulch technology** for rice cultivation. More than 100 farmers at seven locations in Sichuan and Guangxi conducted field trials which entailed placing a large plastic sheet on the ground surface of the paddy fields to raise soil temperatures and slow down water evaporation. The resulting higher yields of rice production attracted considerable media attention on the mainland. One whole village of 72 farmers, in Jianyang City, Sichuan, converted to organic production with plastic mulch, obtaining much higher rice yields compared to conventional fields that do not use the plastic mulch techniques. Measures have now been instituted to collect and recycle the plastic – one of the environmental concerns about using this method. The Jianyang villagers are now selling the organic rice under the brand name 'Xin Tian Fu Rice', and tests have also been conducted for consumers response to the taste of the rice, and results were very positive.

We have also encouraged field trials of similar rice-growing techniques amongst villagers around the Yinggeling Nature Reserve in Hainan, where we continue efforts to help farmers improve their farming techniques so as to reduce pressure on harvesting of forest resources. After a successful small-scale trial at Daoyin Village, the Nankai Township local government invited us to launch demonstration trials of the plastic-mulch rice technology in February. A demonstration of an integrated rice-duck cultivation system was also set-up, in Yuanmen Town to the east of Daoyin Village.



**Organic rice production using plastic mulch produced a higher yield (right) when compared to conventional rice farming techniques (left).**



**A farmer in Sichuan showing the size of her rice plants under plastic mulch cultivation (on her left side) and organic rice using traditional cultivation technique (on her right). The rice are of the same variety and were planted at the same time.**



# HOLISTIC EDUCATION

The KFBG Goal for Holistic Education is: "Widespread, increased awareness of human connections with self, fellow humans, the natural environment and the universe. The broader community more familiar with their native animals, plants and ecosystems, and motivated to safeguard them."

At KFBG, a new 'Plants and Us' Greenhouse and theme Garden – The Fragrant Garden were created, and now welcomes visitors to explore

and connect with nature through plants. New facilities for displaying orchids in a garden and in a glasshouse were works-in-progress. Locally, we conducted a range of school programmes in Hong Kong and Macau, as well as our ongoing series of guided tours, Night Safaris, Nature Fun Days and Animal Keeper Talks, which give our staff opportunities to share their knowledge and enthusiasm with visitors. Art programmes included a SAORI weaving exhibition, and, workshops on felt and eco-printing, and, nature art. We are preparing the ground for more awareness-shifting and transformational learning experiences and programmes.

## Formal Education

We provide a balanced educational experience for visiting schools and universities that covers conservation, connection to nature and transition to sustainable living.

The KFBG **Education Department** worked in partnership with the curriculum development section of the **Education Bureau** of the Hong Kong Government to develop and offer curriculum-based programmes for local schools during 2010. These included a **Life-wide Learning** workshop for secondary school teachers; to introduce the learning resources available at KFBG for conducting secondary school visits; and an orientation session for geography teachers introducing the concepts of **sustainable agriculture and agro-forestry** to support implementation of the New Senior Secondary (NSS) **geography curriculum** in schools.

A summer camp – **In Touch with Nature** – was held during the summer holidays (19<sup>th</sup> – 23<sup>rd</sup> July, 2010). This new programme was organised on a 'day-camp' basis. About 20 secondary and vocational-institute students participated in various activities including woodland field studies, art, group sharing and games, exploring sustainable lifestyles and self-reflection. The participants also attended 'Keeper Talks' on raptors and mules, to better understand the day-to-day work of a nature conservation centre.

## Enhancing the Visitor Experience

We develop programmes and facilities to enable a meaningful experience for all types of visitors.

The **Plants and Us Greenhouse** and **Fragrant Garden** were opened in April and June 2010, respectively, for visitors to enjoy and explore their connection with nature through plants. In the *Plants and Us* Greenhouse in the Lower Farm, with its creative wooden signage, people can interact with



*Dracaena* plant in the 'Plants and Us' Greenhouse that receives special attention from our visitors.



Signage for the 'Plants and Us' Greenhouse.

plants through their five senses – sight, sound, smell, taste and touch – and to join our public experiment of giving love and gratitude to one plant in particular; this plant is currently about twice the size of two ‘control’ plants that receive no special attention from the public.

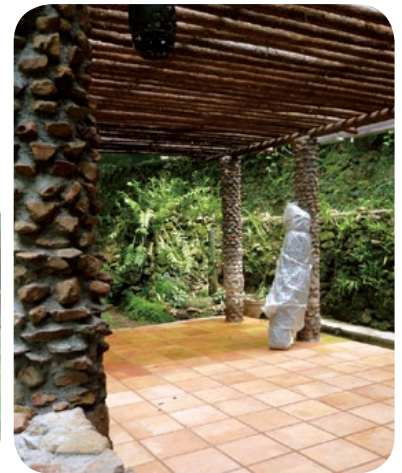
In the Fragrant Garden, plants are grown that give off a pleasant aroma at different times throughout the year so that our visitors can enjoy the seasonal scents of nature. Meanwhile, in our other theme gardens; the **Butterfly Garden** was enriched with native plant species, and the **Fern Walk** was enhanced with a pond to showcase water ferns. A collection of orchids was donated to KFBG by ‘Friend of the Farm’, Veronica Clibborn-Dyer in late 2010. These have been established on logs and wooden slabs for display. In addition, several mature plants of the orchid *Doritis pulcherrima* (Doritis) were mounted on stone walls around the Plaza to beautify the area. Major renovation and rejuvenation work continued in the **Orchid Greenhouse** and in **Orchid Haven**, where we designed landscape features and signage for the new **Gloria Barretto Orchid Sanctuary**. These areas will be enhanced with orchid displays including orchid species native to Hong Kong and southeast China. Our Education Department also designed the garden features and signage for the new Sun Garden Cafe next to the Plaza, which opened in Spring 2011.

Interpretive signage continues to be improved throughout KFBG, with new designs to enhance the visitor experience. Signage has been improved for a number of display areas including the Raptor Lookout and Raptor Sanctuary. There is still a lot of work to do to provide information which clearly informs the public about the rescue activities undertaken by the Fauna Conservation Department and to outline the stories associated with the animals that, for various welfare and other special reasons, we have decided to maintain in captivity.

We organised a range of art programmes in 2010. In January, we took part in a **SAORI** exhibition at the Hong Kong Central Library. SAORI is a free-style hand weaving programme founded in Japan. A large SAORI art piece was woven by hundreds of our visitors and volunteers over many weeks. With no planning or intervention by us, a tree and natural landscape slowly emerged as a piece of artwork. The finished piece was put on public display. Five artists from Hong Kong and Taiwan participated in the **Artist-in-Residence** programme at the beginning of the year. A series of installation artworks on the theme **Nature’s Pulse** were made and presented at KFBG for visitors’ enjoyment from February to April 2010. During the summer holidays, we organised **felt and eco-printing** art workshops



The ‘Pai Lau’ entranceway to the Gloria Barretto Orchid Sanctuary.



A newly refurbished shed in the Gloria Barretto Orchid Sanctuary for visitors to rest and enjoy viewing the plants.



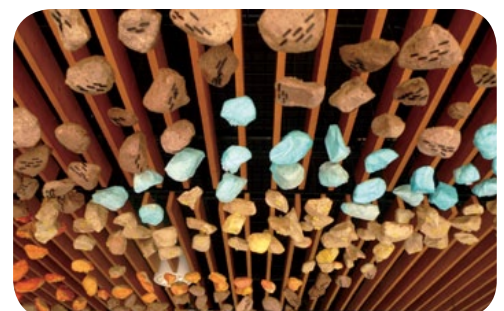
Artist-in-Residence Programme – ‘dragon’ installation artwork.



Artist-in-Residence Programme – creating a ‘dragon’ installation artwork.



A SAORI artwork hand woven at KFBG displayed during an exhibition at the Central Library, Hong Kong.



Artist-in-Residence Programme – ‘The Goddess who Mended the Sky’ installation artwork.



for families with children from seven social-service centres. The workshops offered participants an outdoor experience within the picturesque setting of KFBG, with the opportunity to use different natural materials to create colourful artwork to express their feelings about nature. In the autumn, the **Hong Kong Youth Arts Foundation** organised a one-day **Nature Art** workshop at KFBG for secondary school students. Activities included dance movements, jamming with African drums, flower art installation, and a handicraft workshop making "Dreamcatchers".

We continued to run the popular **Night Safari** events, where invited visitor groups are exposed to the nocturnal world on our hillside. Each event includes a moth trapping exercise, where visitors can learn about the ecology of local moths and discuss moth research with our entomologist. On the insect theme, over 900 **Giant Prickly Stick Insects** were hatched from eggs this year. They grow quickly, so visitors to the Insect House saw the sizes of various larval instars as they develop from egg to the adult form.

A focus for the visitor experience was the **Nature Fun Day** programme, held on the first Sunday of the winter, spring and autumn months, attracting thousands of people. Themes included **Let's Enjoy a Green New Year** (hosted by our China Programme in February 2010), **Food for Thought** (run by the Sustainable Living & Agriculture Department in November 2010), and **Everyday Plants & Their Wild Relatives** (by the Flora Conservation Department in December 2010), with **Animal Discovery Tables** as a regular featured activity presented by the Fauna Conservation Department. A lot of creativity by staff and volunteers went into the activities on these days; in October, a workshop was held to coach volunteers on the skills and information that make these events successful. Another volunteer workshop was conducted in October, to coach our volunteers about communication skills and techniques required for the **Animal Encounter** series of events we intend to run on a monthly basis for the public in 2011.

**Animal Keeper Talks** have become a popular activity for our visitors. These talks, which include the individual animals' stories and interesting animal facts, take place at four locations where visitors can learn about the rescued, captive macaques, birds of prey, wild boar and our working mules. During the year, over 1,000 visitors including school groups (kindergarten to secondary), elderly and general visitors had the opportunity to learn and ask questions about our rescued, captive animals. Six public talks at the Mule Stables highlighted their role in reducing the need for polluting vehicles on our hillside.



A Masked Palm Civet spotted during our Night Safari programme in April 2010.



Primary school students listening to a talk about raptors by one of our Keepers.



Volunteers introducing animal specimens on display at our Discovery Table during the Nature Fun Day events at KFBG.



Satish Kumar (of Schumacher College) lead a transformative workshop at KFBG in March 2010.

Each year, our Special Visitors in turn bring fresh ideas and inspiration to our work. Distinguished visitors in 2010 included Dame Jane Goodall; Dr Satish Kumar from Schumacher College, UK; Dr Phillip Cribb (formerly orchid specialist at the Royal Botanic Gardens, Kew, UK); Mr Ben Klasky, Executive Director of Islandwood (near Seattle, USA); Dr Willie Smits, founder of Borneo Orangutan Survival Foundation and Ms Lu He Ping, Director-General of the Department of Administration and Finance of the Liaison Office of The Central People's Government in Beijing and members of her staff. Local dignitaries visiting KFBG included the Director of the Agriculture, Fisheries and Conservation Department,

Mr Alan Wong and members of his senior staff. Each year, many 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 also visit KFBG.

**Guided tours** are a popular feature for visitors to KFBG. During 2010, 148 guided tours were organised for 5,626 people, to increase their awareness of the displays and work undertaken by KFBG.

Towards the end of each year, an annual running event is organised for members of the public. This challenging uphill **Kadoorie Brothers' Memorial Race** is always over-subscribed and numbers have to be limited to about 250 entrants for safety reasons.

In 2010, we gradually prepared for the opening of a visitor **cafe** at KFBG; in March 2010, the facility was finally connected up to the public water supply system by the Water Supplies Department, and in November 2010, we were granted an Occupation Permit. We received a Temporary Food Factory License and Sun Garden Cafe was opened to the public in April 2011.



A group photo of the participants of the Kadoorie Brothers' Memorial Race 2010.



Idy Wong, Head of the Sustainable Living and Agriculture Department, being interviewed by TVB at the Old Tai Po Police Station.

## Communications

During 2010, there were 173 local newspaper and 15 local magazine reports about KFBG, and 15 television and radio interviews of our staff. The widest local coverage was given to the *Nature's Pulse* art exhibition, and, to KFBG's selection by the Development Bureau to revitalise the Old Tai Po Police Station into a Green Hub. Internationally, the KFBG Hainan Gibbon Conservation Project was reported by *BBC Wildlife* in August 2010.

## Website

KCC's specialist *Living Forests* website [www.kfbglivingforests.org](http://www.kfbglivingforests.org) for conservationists received some 3,300 visits during the year. Plans were also initiated to revamp the KFBG website.

## Transformative Workshops

Preparation is underway to incorporate more transformational, experiential learning programmes into our work, to help people harmonize their relationship with the environment – the KFBG mission – at a deeper level. We have natural allies at Schumacher College in Dartington, UK. Following Schumacher co-founder Dr Satish Kumar's visit to Hong Kong and China in March 2010, which included him running a 3-day workshop at KFBG, our representatives visited the College in the summer to discuss possibilities for collaboration. Specialist staff are being recruited and course designs are being developed and pilot programmes are being tested including 'Silence in Nature' – a silent walk to Kwun Yum Shan with exercises to deeply connect participants to nature.



Article citing the Hainan Gibbon in the *BBC Wildlife Magazine*. (This extract originally appeared in *BBC Wildlife Magazine*, August 2010 'The Funky Gibbons' by Helen Chatterjee. ©BBC Magazines.)



Mr Yang Chun Sen (from Taiwan) being interviewed during the Artist-in-Residence programme at KFBG.



# NATURE CONSERVATION

The KFBG Goal for Nature Conservation is: "The decline of ecosystems and their integrity are halted and reversed. Irreplaceable species and their habitats are conserved in the wild, wherever possible. The active engagement in conservation, among responsible authorities and civil society, is steadily rising."

*KFBG has continued to promote more effective conservation in Hong Kong and South China. In the Mainland, especially*

*on Hainan Island, we continued to help build the capacity of forest-protection staff, and provide key facilities and resources to support them. We have also shared the understanding and use of ecological agriculture and architecture in local communities. A new strategy related to our conservation programmes was being refined throughout the second half of 2010. In Hong Kong, we successfully hatched 11 critically endangered Golden Coin Turtles, and took charge of a consignment of confiscated Madagascan Ploughshare Tortoises – probably the rarest tortoise in the world. We also contributed to conservation more broadly, through many partnerships, publications and workshops.*

## Ex-Situ Species Conservation

We plan, develop and conduct *ex-situ* (outside its natural habitat) approaches for selected priority species as part of integrated conservation programmes.

It has been a busy year at our Wild Animal Rescue Centre at our Hong Kong site. At present, the status and contribution of rescued and **released animals** into wild populations is little known, as there is little information published regarding subsequent survival and reproduction of released species. In May, a rehabilitated **Brown Wood Owl** was released and radio-tracked to

determine its post-release survival and to observe its movements. It was recorded utilising local forested areas for 35 days, during which it must have been naturally feeding. Unfortunately, the carcass of the owl was found on Day 52, so, although it appeared to cope with life in the wild it eventually succumbed, probably to predation. In June, a **Leopard Cat** received by the Wild Animal Rescue Centre was released wearing a collar fitted with a radio transmitter. The rehabilitated cat had been discovered as a youngster trapped in a water channel, a year

earlier. In the first week after release the cat was very active around the KFBG hillside and the adjacent Ng Tung Chai forested area. After 21 days of tracking, the signal was lost and not picked up again. Hopefully, the cat moved out of the Lam Tsuen valley and has established a territory somewhere out of signal range; the collar is designed to drop off.



A Brown Wood Owl prior to release after recovery at our Wild Animal Rescue Centre.



Radio collar being fitted onto a Leopard Cat for post-release monitoring of its movements.

We have continued our intensive efforts to alleviate the devastating **Asian Turtle Crisis**. At our Hong Kong site, our **Golden Coin Turtle breeding project's** incubation season drew to a close when the last egg hatched on 16<sup>th</sup> November, 2010. This year, the number of eggs laid was reduced but we still managed to obtain 11 hatchlings for this critically-endangered species. The DNA profile of ten of these hatchlings match those of the native population, meaning that we can release them back to the wild sometime in the future. We also sent three major shipments of turtles to join *ex-situ* conservation programmes under the umbrella of the **IUCN Turtle Survival Alliance (TSA)**. In July, 39 turtles of five species (Asian Leaf, Southeast Asian Box, Giant Asian Pond, Indochinese Box, and Malayan Snail-eating Turtles) were shipped from our Wild Animal Rescue Centre to Rotterdam Zoo to be dispersed amongst several European conservation centres under the co-ordination of TSA (Europe). Fifty Yellow-headed Temple Turtles were sent to the United States on 19<sup>th</sup> October, 2010. A further 31 Yellow-headed Temple Turtles departed for Europe on 20<sup>th</sup> November, 2010 together with 15 turtles of another three species (Black Marsh, Orange-headed Temple and Malayan Flat-shelled Turtles).

On 14<sup>th</sup> November, 2010, the AFCD sought KFBG assistance with a confiscation of over 950 **Malaysian Box Turtles**. Only part of the group was received for temporary holding and rehabilitation, as the species is well represented in conservation breeding groups internationally, and as we also lacked the space to fully provide humane long-term housing at our site. One hundred and fifty of these turtles are now under rehabilitation and we will be seeking placement in overseas conservation centres as and when the legal proceedings are concluded. This group has stimulated an effort to recover more genetic data from such stock, and plans are in place to begin a collaborative **DNA sampling** programme with the AFCD for this and similar confiscations in the future. Between February and November, almost 2,500 turtles were seized by the authorities, most heading for the food or pet trade in South China.



A Yellow-headed Temple Turtle is being picked up for packing into a crate before its departure to the US to join an assurance breeding colony for the species.



Yellow-headed Temple Turtles – crates packed and ready to go!

In May, a **Fat-tailed Dwarf Lemur**, an endangered Madagascan species, was re-homed to the Rare Species Conservation Centre, in Sandwich, Kent, United Kingdom on behalf of AFCD. It was originally found as a stray in Hong Kong, probably a released pet, and now has joined an *ex-situ* breeding group. A male **Slow Loris** was re-homed on 15<sup>th</sup> May to Augsburg Zoo in Germany, where he will join a lone female for conservation breeding purposes.

Every year, the Wild Animal Rescue Centre in Hong Kong has to deal with a variety of confiscations by the authorities and native animals that are found injured, locally. The total number of animals received, so far, from 1994 to the end of 2010 were 475 mammals, 1,716 birds, 4,176 'stray snakes' and 18,885 other reptiles (a total of 25,252). The turnover during 2010 is illustrated by the total collection figures from the Animal Record Keeping System (ARKS) for the period from 1<sup>st</sup> January to 31<sup>st</sup> December, 2010 on the following page.

## The status of animals received by our Wild Animal Rescue Centre in Hong Kong

	Total in collection at 1 <sup>st</sup> January, 2010	Received / captive-bred	Released / relocated	Died / Euthanized	Total in collection 31 <sup>st</sup> December, 2010
<b>Birds</b>	80	168	84	86	78
<b>Mammals</b>	71	43	19	16	79
<b>Reptiles*</b>	574	1,014**	767	387	434
<b>Amphibians</b>	11	0	0	5	6
<b>Fish</b>	234	0	0	0	234
<b>Total</b>	<b>970</b>	<b>1,225</b>	<b>870</b>	<b>494</b>	<b>831</b>

\* Excluding 'stray snakes' received from the HKSAR Police; \*\* Including eggs laid in captivity.



A Chestnut-winged Cuckoo released at Mai Po after recovery.

Notable **native bird** species received and released by our Wild Animal Rescue Centre at our Hong Kong site in 2010 included a Common Redshank (the first time that we have received this species), Pheasant-tailed Jacana, Watercock and a Chestnut-winged Cuckoo. A new record was set this year for the number of wild birds (167) received at the Centre, surpassing last year's record of 160. The summer months proved to be the busiest time when 110 birds were received, many of them young fledglings such as owls, bulbuls and swallows, displaced from their nests, requiring time-consuming hand-rearing by staff. Observing a weak bird thrive, mature and ultimately being released is a rewarding experience for staff. Unfortunately, around half of the birds received did not survive, either due to injuries sustained or having been displaced from parents at a very young age.

With over 25 cases, the **mammal** rescue team were also busy, and successfully released six Wild Boar, two Barking Deer, a Masked Palm Civet, two Chinese Porcupines, a Leopard Cat and four bats. It is unusual for so many of the larger mammals to pass through the Centre in close succession. We also received our first ever Black-bearded Tomb Bat but unfortunately the injuries it suffered proved lethal. The last time this species was recorded in Hong Kong was over ten years ago, by the Head of our Fauna Conservation Department, Dr Gary Ades.

A Water Monitor was received from AFCD in November. The lizard had appeared on the local news, as villagers had mistaken it for a crocodile.

We pay great attention to the status of **health** with annual veterinary check-up being taken for all the captive display animals in our care. One Wild Boar was treated for mild lameness. The '**Avian Influenza vaccination programme**' resumed in February and October for captive raptors, flamingos and peafowl. All chickens were also vaccinated and testing of their blood samples found an adequate level of antibodies. From September, all of our domestic pigs underwent a health check of their body condition. However, one pig had to be euthanised due to severe uterine problems. Sadly, 'Julie' our Pig-tailed Macaque, who has been with the Centre for over a decade had to be euthanised in March due to a large tumour in her abdomen; permission was granted by the AFCD to bury her on our hillside.



A rescued Masked Palm Civet in our holding facilities prior to release back to the wild.

In June, a Clouded Monitor Lizard was discovered dead in its outdoor enclosure. A post-mortem revealed that it had eaten a wild Hong Kong Newt. These newts are extremely toxic to some animals, and apparently, the monitor was not aware of this danger. Keeping outdoor enclosures completely newt-free is difficult, as these amphibians are able to climb well and crawl through the smallest holes to enter the outdoor enclosures of our captive animals.





**A Barking Deer being returned to the wild by Dr Alex Grioni, our Veterinarian and Paul Crow, our Senior Officer after rescue by the Wild Animal Rescue Centre.**

KFBG staff and consultants continued to contribute to species conservation in the region through a range of **advisory roles** with other conservation organisations and wildlife rescue networks. These included several IUCN Species Survival Commission Specialist Groups, the scientific advisory committee of Ocean Park Conservation Foundation, and the conservation committee of the Oriental Bird Club. One of our team is a co-editor of the ***Asian Primates Journal***, the regional publication of the IUCN SSC Primate Specialist Group, which helps bring important work to the attention of a wider audience, and provides assistance to less experienced primate conservationists in Asia. Staff joined a number of international meetings. Our mainland China team has helped the **Zoological Society of London (ZSL)** prepare a project intended to stimulate greater *in-situ* conservation of the **Chinese Giant Salamander**, which has been identified as the world's most evolutionarily-distinct and globally-endangered amphibian. In May, we joined an international conservation workshop for the species in Xi'an, playing a central role in technical communication. In May, our Fauna Conservation team provided hair samples for a taxonomic and zoogeographic study of Asian **civets and mongooses** being carried out by the **Museum National d'Histoire Naturelle** in Paris. We carried out two rounds of funding reviews for the Turtle Conservation Fund (TCF), a US-based Fund which assists worthy conservation projects on endangered turtles around the globe.

During 2010, KFBG greatly stepped up its commitment to creating **assurance populations of Hong Kong plants** under pressure in the wild; with natural levels of genetic diversity to allow continued evolution – an essential element of conservation. About 30 field trips were carried out by our Flora staff to sites in the New Territories and on Lantau Island to collect seeds, for use in the Native Tree Nursery (NTN)



**One of our Keepers (Leo Ko) releasing a Crested Goshawk.**

and for storage in the Seed Bank which, in 2010, incorporated collections of about 51 plant species, all of which have been subjected to germination testing. In the Native Tree Nursery, around 50,000 seeds of about 140 native tree and shrub species were sown and cultivated. By the end of 2010, the NTN held 39,913 seedlings of 307 native tree, shrub and climber species.

In 2010, work commenced on a major upgrade of our **Conservation Laboratories** which, when completed, will allow new genetic approaches to plant and animal conservation to be implemented on-site. Scientific applications include identifying populations of plants most at risk of decline and extinction, and pinpointing the source populations of endangered plants and animals illegally imported into Hong Kong with a view to bringing about their repatriation. The new laboratory at our Hong Kong site is expected to be fully operational from the autumn of 2011. In the meantime, micro-propagation techniques have been applied for the successful **germination and growth of seedlings** of many **rare and threatened native orchid** species, including *Aphyllorchis montana* (Yellow Ghost Orchid), *Bulbophyllum bicolor* (Two-coloured Bulbophyllum), *B. levinei* (Levine's Bulbophyllum), *Calanthe masuca* var. *sinensis* (Pink Calanthe) and *Dendrolirium lasiopetalum* (Downy Eria), as well as several exotic species, including *Dendrobium nobile*, *D. williamsonii*, *Holcoglossum wangii*, *Paphiopedilum appletonianum* and *P. dianthum*, all of which play an important role in our ongoing conservation and education programmes.

**Orchid seed collection and storage** were carried out as plants in our living collections came into fruit. Seventy-five seed capsules from 19 species were harvested, their seeds removed and dried followed by storage at -20°C, as part of an international collaboration (**Orchid Seed Stores for Sustainable Use**, <http://ossu.org/>) organised by the Millennium Seed Bank in the United Kingdom to place seeds of endangered orchid species into secure storage as an insurance against extirpation in the wild.



## In-Situ Species Conservation

We plan, develop and conduct *in-situ* (within its natural habitat) approaches for selected priority species as part of integrated conservation programmes.

The number of threatened species in our region is truly daunting. In Hong Kong, Fauna Conservation staff, with assistance from volunteers, undertook four field surveys for illegal traps at prime **Golden Coin Turtle** sites. The fieldwork was co-ordinated with searches carried out by AFCD enforcement officers. Trapping of turtles was still widespread but less intensive than in previous years. This may be the result of increased patrols by the authorities and raised public awareness. During the trapping surveys, which took place in the summer, over 15 baited traps were discovered and one trap contained a live Big-headed Turtle, which was removed and released. AFCD have stepped up their monitoring of certain streams and we hope to work with them in the next few years to start releasing turtles in secure areas.

On the Mainland, some species are on the very verge of extinction and require urgent specific action. Our mainland China Team's project on the **Yunnan Box Turtle** which until recently was declared extinct by the IUCN Red List took a great leap forward when wild turtles were discovered and the captive population at a secure location bred successfully. In view of the immense threat to the species from traders, this project has to be managed with a very low profile; we can only hope that there is a future for this critically endangered turtle species.

Seven years after beginning our **Hainan Gibbon** conservation project at Bawangling National Nature Reserve, Hainan, we have launched a new phase with the Hainan Wildlife Conservation Bureau. The small team of wardens protecting and monitoring the gibbons face arduous conditions in the field and we continue to support them as much as we can. The conservation effort has been extended to the surrounding indigenous communities by recruiting the local Li and Miao minority people into the monitoring team, who are then trained by the more experienced team members. We have provided technical and logistical support to an Australian doctoral candidate, Jessica Bryant, from University

College London and the Zoological Society of London (ZSL), who started field research on Hainan Gibbon conservation biology, this year. We also supported the planting of almost 900 large saplings of five native species of figs, next to the home range of the gibbons. Our hope is that these will strengthen habitat quality and that food availability will not become a limiting factor for the next generation of gibbons.



Nicknamed 'Farmers of the Forest', hornbills are well documented as important seed dispersers in the Tropical Rain Forests of Asia.



Pamphlets of our Oriental Pied Hornbill conservation project were distributed to the communities surrounding Xidamingshan Nature Reserve, Guangxi.

We continue to work with the staff and partners of Xidamingshan Nature Reserve in Guangxi to safeguard South China's last known population of the **Oriental Pied Hornbill**. It is estimated that there are around 60 wild birds left in this reserve, which possibly holds the largest resident population for the species in China.

Dr Zhou Youbing (Institute of Botany, Chinese Academy of Sciences), a former holder of a KFBG Studentship, and his doctoral student, 2009 Studentship holder Zhong Jie, have begun ecological field work at Xidamingshan on the role of the Oriental Pied Hornbill as a seed dispersing agent in the

forest. Meanwhile, our staff and volunteers organised conservation education activities at two local primary schools, and distributed a pamphlet designed by volunteers on Guangxi birds to staff and communities surrounding the reserve. Volunteers also gave training on bird identification to 20 Xidamingshan staff in



Conservation of the Hainan Gibbon – a discussion with candidates applying to be community wardens during a group interview session.

September. We are currently examining the implications of the extensive local cardamom production on the conservation of the hornbills, and preparing management recommendations for the reserve.



A rare fern *Cyrtomium falcatum* was found during our survey of ferns on Hong Kong Island.



With greater protection of the natural forest, Sambar Deer (mother with a juvenile) can now be more easily seen along an old logging track at Yinggeling.



Staff carrying out a field survey of ferns at Wong Lung Stream, Lantau Island, Hong Kong.

At Yinggeling, Nature Reserve, Hainan, after our joint efforts over several years, the staff re-discovered the **Red-breasted Parakeet** in November, this species had been feared extirpated in Hainan for decades. The species, the only native parrot in Hainan, has symbolic significance for Yinggeling which means 'Parrot Range'.

Since its beginnings, the KFBG China Programme has sought to obtain a better understanding of the status of **wild mammals** in South China. Most wild mammal species are scarce and only active at night, so direct observation of their presence can be difficult. After using camera traps for some years, we have upgraded the mammal survey with new models of digital infra-red auto-triggered cameras. Eighteen of the 27 newly-purchased camera traps were set-up in seven sub-divisions of Yinggeling, four in Exianling Limestone Forest, and five in Nonggang National Nature Reserve, Guangxi. In the more than 2,400 photos and video clips, we have recorded at least 24 mammal species and 14 bird species including threatened species like Sambar Deer, Hainan Peacock-pheasant and the Hainan Partridge. The Exianling cameras reveal a high density of small and medium-sized animals, and highlight the integrity of the forest despite on-going hunting pressure.

We have started to make significant, systematic inroads into the challenges of *in-situ* conservation of **native plants**. In 2010, to guide such conservation efforts, about 40 field surveys were conducted in the Hong Kong New Territories, on Lantau, Lamma and Hong Kong Islands, and in Guangxi and Hainan Provinces to help build-up our knowledge of the distribution and conservation status of plants throughout the region. During these surveys, 710 specimens, representing about 210 plant species were collected and are now deposited in the KFBG Herbarium at the KFBG site in Hong Kong. Our collaborators, including Dr Yan Yuehong and Mr Liu Bingrong, both fern experts from the Hunan University of Science and Technology in mainland China, continued to work with us to study the diversity and conservation status of these native Hong Kong plants.



Hainan's long-lost Red-breasted Parakeet was re-discovered at Yinggeling Nature Reserve in November 2010.



One-year-old fig tree saplings (produced from stem cuttings) before planting out to restore forest habitat in Bawangling, Hainan.

Staff in our Orchid Conservation Section continued their programme of **orchid surveys** throughout Hong Kong to record species distribution, abundance and to record ecological attributes such as phenology and fruit production. This data is being used to gauge the conservation status of the wild orchid populations. New populations of several rare species including *Pecteilis susannae* (Susan Orchid), *Bulbophyllum delitescens* (Straight-lipped Bulbophyllum), and *Ludisia discolor* (Rock Silkworm), were sighted and confirmed. Furthermore, regular monitoring of populations of *Dienia ophrydis* (Purple Featherduster), *Habenaria dentata* (Toothed Habenaria), and *Goodyera viridiflora* (Green-flowered Rattlesnake Plantain), indicate that these and other wild populations in Hong Kong are successfully recruiting new individuals. After having compiled a current **database of sightings** of Hong Kong's native orchids, together with more than 3,500 records amassed in our computerised system of verified orchid sightings spanning the last 150 years; this is now being used to analyse how each species' abundance and distribution has changed spanning a time period from two centuries, ago. We are using the data to generate distribution maps and International Union for Conservation of Nature and Natural Resources (IUCN) Red List assessments for each individual species, all of which will be included in the forthcoming book *The Wild Orchids of Hong Kong*. Databases for the Herbarium and Seed Bank were also set-up.





*Platycodon grandiflorus*, a rare climbing plant species, was found during one of our field surveys in Hong Kong.



A rare orchid, *Paphiopedilum purpuratum*, sighted in the wild during our field surveys in Hong Kong.



A rare orchid, *Coelogyne fimbriata* var. *leungiana*, was sighted in the countryside during our orchid field survey work in Hong Kong.

**Specialist scientific publications** from **KFBG staff and consultants** or project executants/Studentship holders (\*) for 2010 are listed as follows:

Title	Authors	Journal / Publication
Degradation of tropical forest in Hainan, China, 1991 to 2008: conservation implications for Hainan Gibbon ( <i>Nomascus hainanus</i> ).	*Zhang Mingxia, <b>John Fellowes</b> , Jiang Xuelong, Wang Wei, <b>Bosco Chan</b> , Ren Guoping & Zhu Jianguo	<i>Biological Conservation</i> 143: 1397-1404.
Constraints on establishment in an endangered terrestrial orchid: a comparative study of <i>in-vitro</i> and <i>in-situ</i> seed germinability and seedling development in <i>Nervilia nipponica</i> .	<b>Stephan Gale</b> , Jun Yamazaki, Michael Hutchings, Tomohisa Yukawa & Kazumitsu Miyoshi	<i>Botanical Journal of the Linnean Society</i> 163: 166–180.
Carnivores (Mammalia: Carnivora) in South China: a status review with notes on the commercial trade.	<b>Michael Lau</b> , <b>John Fellowes</b> & <b>Bosco Chan</b>	<i>Mammal Review</i> 40(4): 247–292.
<i>Pteris changjiangensis</i> (Pteridaceae), a new species from Hainan Island, China.	*Zheng Xilong, Wang Faguo, Zhang Rongjing & Xing Fuwu	<i>Annales Botanici Fennici</i> 47: 156–158.
<i>Bulbophyllum bicolor</i> .	<b>Stephan Gale</b> , <b>Jackie Wang</b> & <b>Mark Isaac-Williams</b>	<i>Curtis's Botanical Magazine</i> 27: 328–338.
Food source plants of birds in the "Bird basins" hunt region of Dayaoshan Mountain of Jinxiu and their ecological conservation.	*Zhou Tianfu, An Jiacheng, Lan Ling, Tan Haiming, Yang Shanyun & <b>Lee Kwok Shing</b>	<i>Guihaia</i> 30(2): 233–236.
Inter-specific relationships and hierarchical spatial genetic structuring in <i>Nervilia nipponica</i> , an endangered orchid in Japan.	<b>Stephan Gale</b> , Ayako Maeda, Chen-I Chen & Tomohisa Yukawa	<i>Journal of Plant Research</i> 123: 625–637.
Mechanisms for recruitment and population growth in <i>Nervilia nipponica</i> , an endangered orchid in Japan.	<b>Stephan Gale</b>	<i>Acta Horticulturae</i> 878: 53–60.
Chlorogomphinae dragonflies of Guizhou Province (China), with first descriptions of <i>Chlorogomphus tunti</i> Needham and <i>Watanabeopetalia usignata</i> (Chao) larvae (Anisoptera: Cordulegastridae).	*Zhang HM & Tong XL	<i>Odonatologica</i> 39(4): 341–352.
<i>Indocypha catopta</i> sp. nov. from Guizhou, China (Odonata: Chlorocyphidae).	*Zhang Haomiao, Matti Hämäläinen & Tong Xiaoli	<i>International Journal of Odonatology</i> 13(2): 231–240.
Descriptions of two new species of the genus <i>Planaeschna</i> from China (Odonata: Anisoptera: Aeshnidae).	*Zhang Haomiao, Yeh Wenchi & Tong Xiaoli	<i>Zootaxa</i> 2674: 51–60.

Title	Authors	Journal / Publication
Descriptions of the final instar larvae of three Chinese <i>Idionyx</i> species (Odonata: Anisoptera: Corduliidae).	*Zhang Haomiao & Tong Xiaoli	<i>Zootaxa</i> 2716: 53-63.
Lost island re-discovered – the tropical rainforest of Hainan Island, China.	<b>Bosco Chan</b> & *Zhang Mingxia	<i>ATBC 2010 Abstract Book</i>
Skip it or keep it? The importance of skipper (Lepidoptera: Hesperidae) immature information to biodiversity assessment in northern Indo-China Bioregion.	<b>Philip Lo</b>	<i>ATBC 2010 Abstract Book</i>
Using camera traps to engage local people in participatory wildlife monitoring in South China.	<b>Jay Wan</b>	<i>ATBC 2010 Abstract Book</i>
Fung Yuen SSSI & Butterfly Reserve Moth Survey 2009.	<b>Roger Kendrick</b>	<i>KFBG Publication Series 6</i> <a href="http://www.kfbg.org.hk/content/35/23/2/2009FungYuenMothSurveyFINAL_2010June.pdf">www.kfbg.org.hk/content/35/23/2/2009FungYuenMothSurveyFINAL_2010June.pdf</a>
The impact of conservation on the status of the world's vertebrates.	Michael Hoffmann <i>et al.</i> (many co-authors including <b>Michael Lau</b> )	<i>Science</i> 330: 1503-1509.
Endemic seed plant species from Hainan Island: a checklist.	Javier Francisco-Ortega, Fa-Guo Wang, Zhong-Sheng Wang, Fu-Wu Xing, Hong Liu, Han Xu, Wei-Xiang Xu, Yi-Bo Luo, Xi-Qiang Song, <b>Stephan Gale</b> , David Boufford, Mike Maunder & Shu-Qing An	<i>Botanical Review</i> 76: 295–345.
Seed plant endemism on Hainan Island: a framework for conservation actions.	Javier Francisco-Ortega, Zhong-Sheng Wang, Fa-Guo Wang, Fu-Wu Xing, Hong Liu, Han Xu, Wei-Xiang Xu, Yi-Bo Luo, Xi-Qiang Song, <b>Stephan Gale</b> , David Boufford, Mike Maunder & Shu-Qing An	<i>Botanical Review</i> 76: 346–376.
Ranging and activity patterns of the group-living Ferret Badger <i>Melogale moschata</i> in central China	Zhang Liang, Wang Yanping, *Zhou Youbing <i>et al.</i>	<i>Journal of Mammalogy</i> 91(1):101-108.
Species abundance and conservation of coastal wintering waterbirds in Hainan Island, China	Zhang Guogang, Liang Wei, Liu Dongping, Qian Fawen, Hou Yunqiu, Su Wenba, Mike Kilburn, Jemi Holmes & <b>Lee Kwok Shing</b>	<i>Chinese Birds</i> 1: 204-210.
Microlepidoptera of Hong Kong: Taxonomic study on the genus <i>Dichomeris</i> Hübner, 1818, with descriptions of three new species (Lepidoptera: Gelechiidae).	Li HH, Zhen H, <b>Roger Kendrick</b> & Sterling MJ	<i>SHILAP Revista de Lepidopterología</i> 38(149), 67-89.
New insights to the molecular phylogenetics and generic assessment in the Rhacophoridae (Amphibia: Anura) based on five nuclear and three mitochondrial genes, with comments on the evolution of reproduction.	Li Jiatang, Che Jing, Robert Murphy, Zhao Hui, Zhao Ermi, *Rao Dingqi & Zhang Yaping	<i>Molecular Phylogenetics and Evolution</i> 53: 509-522.
Plant inventory in the Solomon Islands, with special reference to medicinal plant resources (1). Medicinal plant resources used in complementary medicine by customs doctors on Malaita Island.	Watanabe T, <b>Stephan Gale</b> , Okada M, Tofu P, Pitisopa F & Koyama T	<i>Journal of Japanese Botany</i> 85: 30–45.

The KFBG-funded Special Issue on Hainan **limestone forest conservation** in the Chinese journal *Tropical Forestry* is now available on Chinese literature database websites. A number of new publications are in preparation or in press, notably **The Wild Orchids of Hong Kong**. This book is based on the life's

work of the late Mrs Gloria Barretto. It is a collaborative project between Dr Stephan Gale of KFBG, Dr Phillip Cribb of the Royal Botanic Gardens, Kew, UK; Karen and Ruy Barretto and Mark Isaac-Williams; the manuscript for this book was completed and will be published in the autumn of 2011.



## Building Conservation Capacity

We are seeking to maximise effectiveness of all conservation actions by building capacity among stakeholders.

In 2010, building the **conservation management capacity of nature reserve staff** in Hainan remained a major focus of our work in the Mainland. The year began in lively style with the mainland China team joining the **Yinggeling Nature Reserve** annual assembly event in Baisha (Hainan), contributing to lectures, and, joining in sports and public awareness-building activities, geared to train and inspire field staff and boost the nature reserve's profile in the city. Over 1,000 people attended a public concert which featured performances by professional singers and dancers, villagers, staff of Yinggeling – and of KFBG. Yinggeling Nature Reserve is the largest terrestrial nature reserve in Hainan. It is over 5,000 square kilometres and has more than 200 wardens to protect the forest and all the plants and animals within the reserve. It takes about four hours to reach Yinggeling Nature Reserve by car from Haikou.

During the year, a number of our key partners in Hainan changed job positions, slowing progress in some areas while new officials were appointed and our mutual understanding was built-up and working connections were re-established. At Yinggeling, the growing capabilities of the middle-management staff have allowed us to gradually step back, as we always envisaged, though our China Programme head, Dr Bosco Chan remains seconded as a Deputy Director to the reserve. Meanwhile, we have also devoted more attention

to building staff capacity and improving facilities at the spectacular Limestone Forest of **Exianling**, whose wardens are managed by our consultant Mr Li Shining, who is also with the Hainan Wildlife Conservation Bureau. Here, the construction of the Nanlang Sub-station outpost, built with KFBG funding, was completed in January 2010. A compost toilet, the first toilet in their community, was built beside the sub-station in April with the assistance of Yinggeling wardens. A micro-hydroelectric generator was subsequently installed to provide electric power to the sub-station. Uniforms with the new Exianling logo, featuring the unique profile of the limestone outcrop itself, were distributed to the wardens in November 2010.

A very popular activity, undertaken annually at Yinggeling Nature Reserve, is to lead a team of wardens and staff on a five-day patrol across the mountain range, to provide opportunities for improving their field knowledge and raising the enthusiasm of the wardens for their work in protecting the pristine landscape and its wildlife. While the forest is generally well-protected with plentiful signs of large mammals, some traps and hunter campsites were found and destroyed. Enforcement remains a major challenge to ensure such illegal activities in the forests are kept to a minimum. During the year, most of the Yinggeling office staff were sent to the two sub-stations at Nankai and Gaofeng to help review and monitor management work, and to help improve the effectiveness of the warden patrols. A stumbling-block since the establishment of the Yinggeling Nature Reserve has been the lack of a formal Yinggeling Forestry Police Bureau but this was finally formed in 2010 after the Chinese New Year. Li Zhilong, a former Deputy Director of Yinggeling Nature Reserve, has been appointed



Dr Bosco Chan delivering a talk on species identification to the wardens and management staff of two Nature Reserves in Hainan.



Hong Kong eco-tourists observing wildlife along the river bank at Yinggeling. Note the local fish funnel trap in the middle of the photo.

as the Officer-in-Charge of this unit. The establishment of this Bureau has greatly improved the efficiency of enforcement and protection of the nature reserve.

A focal point for staff capacity-building this year was the selection of two teams of 16 wardens and officers from Hainan to join our **inter-province exchange** tours to Nonggang National Nature Reserve, Guangxi, in August 2010. During the tour, they shared achievements, challenges and possible solutions for more effective management of nature reserves with their Guangxi counterparts.

Besides management, a focus for staff training at Yinggeling and Exianling has been **species identification**. After one such training session, it was heartening to see wardens queue up to confirm identification of wildlife that they had photographed during their patrols. In June 2010, four wardens received advanced training on butterfly identification and survey techniques, after showing great personal interest in insects and macro-photography. We also hosted a tree-identification training course at Bawangling National Nature Reserve, Hainan in December. More than 40 participants: nature reserve officers, the gibbon monitoring team, and wardens from Yinggeling

and Exianling, learned about the identification characteristics of common tropical trees in primary forest.

We also sought to facilitate the reserves' ability to attract and wisely-use **external funding support for forest conservation and restoration**. As a voluntary carbon offset initiative, we helped Yinggeling Nature Reserve draft and sign contracts to plant 3,500 native trees, to offset the carbon footprint of two international conferences organised by The University of Hong Kong. With Yinggeling, we also successfully obtained a grant from the Turtle Conservation Fund (under the IUCN Tortoise and Freshwater Turtle Specialist Group) to survey and assess the reserve's current status for turtle species.

In November 2010, we facilitated the experimental visit of a group of Hong Kong nature-photographers to Exianling and Daoyin, Hainan. We are exploring whether such nature-based tourism can bring benefits to the local communities, the reserve wardens and the visitors themselves. Visiting scholars, too, can contribute to the reserve's technical capacity and we try to make use of such opportunities when they arise.

In May 2010, we helped facilitate a doctoral candidate from The University of Hong Kong conduct a field study on the pollination of a primitive plant, *Dasymaschalon trichophorum*, at Yinggeling; in return, wardens received training on identifying local plants while the local community received income for providing logistical and accommodation support. In September, Hong Kong entomologist George Ho surveyed Yinggeling for stick-insects and leaf-insects. Eventually, he will provide identification guidance and assistance from his resulting publications.



A female of a rare skipper species, *Satarupa gopala*, was photographed by Exianling wardens at the summit of Jianfengling, Hainan, during a butterfly identification training workshop.



A White-browed Keelback (*Amphiesma boulengeri*) found during a five-day patrol hike at Yinggeling Nature Reserve.



Wardens of Exianling Nature Reserve building the first ever compost toilet in their community.



Following on from our successful collaboration at Yinggeling, we were asked to facilitate a **SWOT** (Strengths-Weaknesses-Opportunities-Threats) **workshop** in August for the **Hainan Forestry Research Institute**. About 40 staff attended this, their first such activity, and considered it helpful to the development of their planning processes.

We have facilitated the introduction of sustainability concepts in the Mainland through the building of the **Daoyin Community Centre** in Hainan; a communal village structure built using a 'rammed earth' technique and strengthened with a small amount of cement and local materials was completed in July. This communal structure was built to showcase the use of local building materials with low Ecological Footprint. It has already proved popular as a cool refuge for villagers during the hot weather. In addition, compost toilets, which have previously been constructed at Daoyin Village, have also been introduced to the indigenous communities on the surrounding mountainsides. We also introduced concepts such as building resilience to Climate Change and Peak Oil, and sustainable living principles, to our mainland conservation network via a special issue of our *Living Forests* magazine. We gave a talk on the same theme to the 200 staff of Yinggeling Nature Reserve, Hainan, during their annual assembly in January 2010.

The **KFBG Studentships** project has been running since the early days of the mainland China Programme, supporting postgraduate studies especially field-based ecological research, since 1998. In view of the changing financial circumstances and the more broadly available research funding resources in the region, and our desire to be more flexible in support of conservation-related capacity-building, it was decided that 2009-2010 would be the last year of the KFBG Studentships intake.



Although built with simple materials, the Daoyin Community Centre serves an important function as a training centre, research station and accommodation for eco-tourists (Photo by Jiang En Yu @ Xinhua News).



KFBG's mainland China team members with Exianling Nature Reserve wardens in their new uniform.



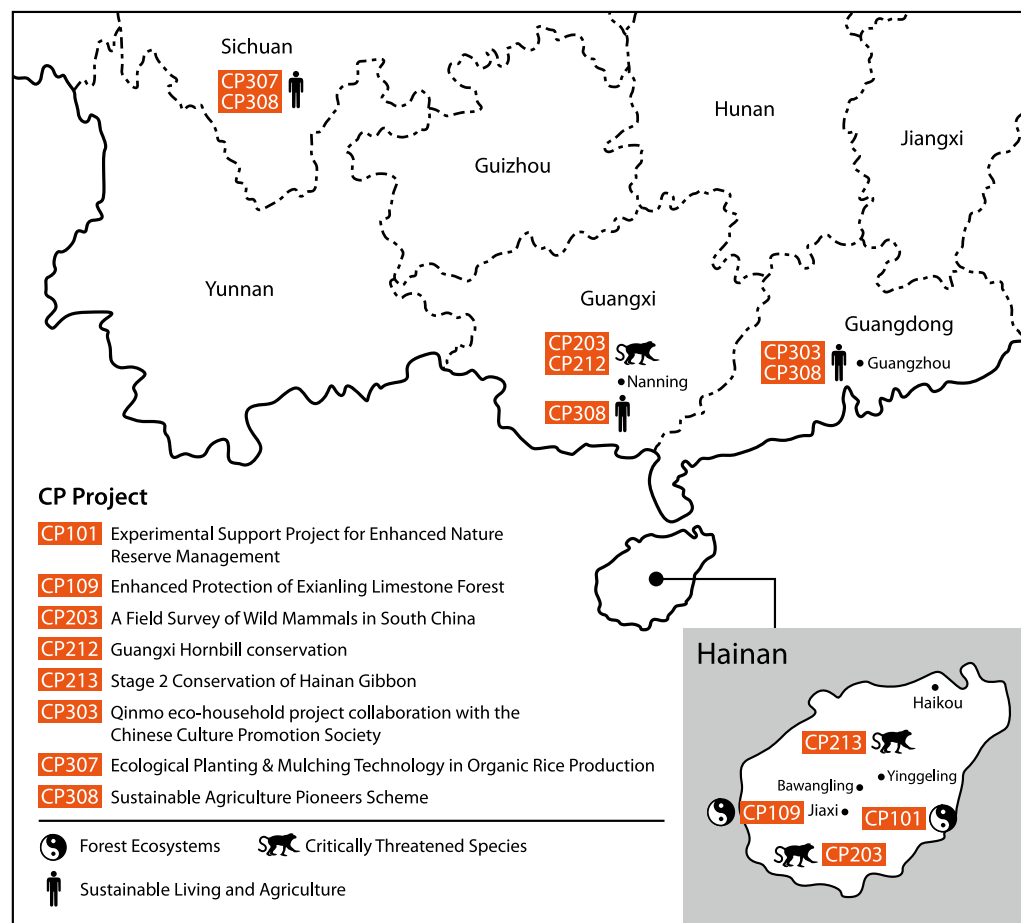
Wardens from Bawangling and Yinggeling Nature Reserves and the Exianling Limestone Forest joined a native tree identification training programme at Bawangling. Note the buttress root of the tree is longer than our line of people!

In Hong Kong, the staff of our Fauna Conservation Department were actively engaged in sharing our wildlife husbandry and veterinary training experiences at the Ocean Park 3<sup>rd</sup> Regional Animal Training / IMATA Seminar in November. Dr Alex Grioni attended the Animal Health Workshop: Zoonotic Disease and Urban Animal Control, in September, organised by the Agriculture, Fisheries and Conservation Department at Kowloon Park, Hong Kong. We also collaborated with the Wildlife Conservation Society (WCS) China for the **Wildlife Rescue and Confiscated Animal Placement Workshop** in Guangdong, and joined the **Wild Animal Rescue Network Workshop** in Cuc Phuong, Vietnam. Capacity-building opportunities were also undertaken in Hong Kong, including guest lectures given at the **Hong Kong Polytechnic University** and **Royal Veterinary College Veterinary Nursing** course; a **Handling Wildlife Encountered at Work Workshop** for the Environmental Protection Department; and the second **Snake Awareness Training Workshop** for the Hong Kong Police Special Duties Unit to assist with their snake identification and animal conflict handling situations. Furthermore, a professional training workshop and practical demonstration of **snake handling skills** was arranged for Macau Government officers on 28<sup>th</sup> May at KFBG. We continued to provide veterinary care and husbandry advice to WWF Hong Kong for the Water Buffaloes at the **Mai Po Marshes Nature Reserve** and the Society for the Prevention of Cruelty to Animals (SPCA). We remain a source of expert advice to **local hospitals** regarding snakes and snakebite cases. Appropriate treatment after a bite may help to save the lives of citizens in Hong Kong (see Wong OF *et al.* 2010, *Hong Kong Medical Journal* 16: 36-43, [www.hkmj.org/article\\_pdfs/hkm1002p36.pdf](http://www.hkmj.org/article_pdfs/hkm1002p36.pdf)).



Senior Officer, Paul Crow demonstrating handling procedures for a live snake to the Hong Kong Police Special Duties Unit in May 2010.

#### Map of Southern China showing the location of KFBG's mainland China Projects





During the summer, staff of the Flora Conservation Department trained two interns from the College of International Education, Hong Kong Baptist University on basic operations of the Native Tree Nursery, Landscape Nursery and the Herbarium. In addition, the Flora team co-organised the **BGCI-KFBG Travel Scholarship Programme 2010** with Botanic Gardens Conservation International (BGCI), to train four young scientists from China on **Concepts and Techniques for Tree Management** from 29<sup>th</sup> November to 17<sup>th</sup> December. The participants were:

Name	Position / role	Organisation
<b>Ms Han Chun-yan</b>	Assistant Professor	Kunming Institute of Botany, Chinese Academy of Sciences, Kunming
<b>Ms Xiong Lin</b>	Technician	Nanshan Botanical Garden, Chongqing
<b>Mr Yang Jun</b>	Researcher	Nanjing Botanical Garden Memorial Sun Yat-Sen, Nanjing
<b>Mr Zhou Quan</b>	Tree Management Officer	Xishuangbanna Tropical Botanical Garden, Chinese Academy of Sciences, Yunnan

During 2010, staff took advantage of a number of opportunities to share knowledge and experience through participation in international meetings. Flora Conservation Department staff took part in conferences in Taichung, Taiwan (**ISHS International Orchid Symposium**, 12<sup>th</sup> to 15<sup>th</sup> January); Norway (**Sustainable Conservation: Bridging the Gap between Disciplines**, Trondheim, 15<sup>th</sup> to 18<sup>th</sup> March) and in the mainland (**East Asian Orchid Diversity and Conservation Symposium**, Guangxi, 3<sup>rd</sup> to 5<sup>th</sup> November, and **Asian Pteridology (Ferns) Symposium**, Shenzhen, 15<sup>th</sup> to 17<sup>th</sup> November). Senior Conservation Officer, Dr Roger Kendrick was invited to present the keynote speech at the third **Asian Lepidoptera Conservation Symposium & Training Workshop** in Coimbatore, India, and staff joined the **Wildlife Enforcement Training Workshop** in collaboration with the Wildlife Conservation Society (WCS), held in Nanning, Guangxi. Senior Conservation Officer, Dr Michael Lau was invited to Missouri, USA to present a talk on the subject of Chinese turtle farming to a policy-level workshop on **Turtle Conservation and Trade**, organised by the US Fish and Wildlife Service.

**Flora Conservation Department** staff met with potential collaborators, including colleagues from the Agriculture, Fisheries and Conservation Department (AFCD) of Hong Kong and the Fairchild Botanic Garden of Florida, to explore possibilities for future collaboration. Meanwhile, Orchid Conservation Section staff developed links with orchid researchers at the National Orchid Conservation Centre in Shenzhen, mainland China.



Participants of the Asian Lepidoptera Conservation Symposium using a light trap to attract moths and other nocturnal insects.



Participants of the Asian Lepidoptera Conservation Symposium admiring a moth attracted by the light trap.



Unauthorized site formation and excavation works undertaken at Tai Long Sai Wan, Sai Kung.



Forested slopes covered by luxuriant vegetation under threat of development at Sha Lo Tung.



Destruction of wetlands and old paddy fields at Sham Chung. Photo taken in March 2011.



Channelization of the Lam Tsuen River – these man-made construction projects are changing vibrant natural river systems in Hong Kong into barren concrete channels.

## Ecosystem Conservation

We plan, develop and conduct ecosystem conservation and restoration projects, and promote and demonstrate protected area management in Hong Kong and South China.

Our efforts to conserve the globally-significant forest ecosystems in South China have concentrated on building the capacity of those responsible, and helping reduce conflicts with local communities by means of livelihood interventions that help take the pressure off forest resources. We have also kept a watchful eye on Hong Kong's own ecosystems, which face the constant threat of damage or destruction through inappropriate development. Our **Ecological Advisory Programme (EAP)** submitted comments on many planning and development applications; the list is a reminder of the need for vigilance

against needless loss of biodiversity. In 2010, we took part in over 25 advisory consultation meetings, including a Five-year Plan meeting on the Deep Bay RAMSAR site with the Agriculture, Fisheries & Conservation Department (AFCD) of the Hong Kong Government; a Lam Tsuen River Advisory Panel meeting with Drainage Services Department; and meetings on the Sha Lo Tung site; the Sham Chung future development plan; the Silvermine Cave project with the Civil Engineering and Development Department; and the Lok Ma Chau Loop with the Planning Department.

In early June, WWF Hong Kong and KFBG spotted damage to land at **Sai Wan, Sai Kung**, during a visit to a proposed mobile-phone station. The damage to what appeared to be Government Land was reported to the AFCD and Lands Department on 8<sup>th</sup> June. Subsequently, the media and other Green Groups raised a public outcry about destruction to this area of extreme natural beauty, and illegal development activity was confirmed. The Hong Kong Government is now working on a Development Permission Area (DPA) plan for this site and other unprotected enclaves within the Country Parks boundaries.

This would give statutory protection to sites which presently lack any kind of development permission plan.

In collaboration with WWF Hong Kong and the Green Lantau Association, we raised concerns to the Authorities regarding the poor environmental performance record of development projects requiring **Environmental Permits**, during an Environmental Protection Department (EPD) Green Groups liaison meeting in April. EPD shared our concerns and, as a result, all such projects now have to submit an independent Environmental Monitoring and Audit report.



**Comments submitted by the Ecological Advisory Programme on planning proposals in 2010, with subsequent decisions of the Town Planning Board (TPB)**

Case No.	Location	Nature of application	Comments from EAP	TPB decision (as at August 2011)
A/SLC/115	Shap Long, Lantau	Small house in GB	(i) Degradation of value and function of GB (ii) 'Destruction-first' approach has been taken	Withdrawn by the applicant
A/NE-TK/329	Shan Liu	Small house in GB	(i) Degradation of value and function of GB (ii) Not in line with planning intention	Rejected
A/NE-TK/330	Shan Liu	Small house in GB	(i) Degradation of value and function of GB (ii) Not in line with planning intention	Rejected
DPA/NE-HH/1	Hoi Ha	Draft DPA Plan	(i) High conservation value of the secondary forest (ii) Rare species has been recorded in the designated area (iii) Zone as CA to effectively protect the valuable habitats	Under plan making process
DPA/NE-SLP/1	So Lo Pun	Draft DPA Plan	(i) Secondary forest and stream in northwest should be zoned as CA (ii) Mangrove community should be zoned as CPA allowing natural recovery	Under plan making process
DPA/NE-MTL/1	Ma Tso Lung and Hoo Hok Wai	Draft DPA Plan	(i) High conservation value of the fishponds and wetlands (ii) Suggest zoning the area as CA to prevent further degradation	Further consideration of representations and comments
DPA/NE-LMH/1	Lin Ma Hang	Draft DPA Plan	(i) Suggest zoning the Robin's Nest area as CA rather than GB (ii) Zone the Tong To Shan Tsuen forest as CA (iii) Lin Ma Hang stream and its tributaries should be zoned as SSSI	Further consideration of representations and comments
DPA/NE-STK/1	Sha Tau Kok	Draft DPA Plan	(i) Forest on the northern slope of Robin's Nest should be zoned as CA rather than GB (ii) Sizes of the V-zones need to be re-examined	Further consideration of representations and comments
Y/YL-PN/3	Pak Nai	Rezoning AZ to Other Use (Rural Use) Zone	(i) Agricultural land should be preserved (ii) Foreseeable ecological impact of the proposed development	Withdrawn by the applicant
Y/SK-TMT/4	Ping Tung	Rezoning GB to VZ	(i) The existing VZ has not been fully occupied (ii) Feng shui wood species in the GB (iii) Degradation of the function of the GB	Rejected
A/YL-PN/26	Pak Nai	War games playground on AZ	(i) Inappropriate land use (ii) Not in line with the intention of pond filling for an education centre in 1999	Rejected
A/YL-PN/27	Ha Pak Nai	Pond filling at CPA Zone	(i) Degradation of CPA (ii) Not in line with the planning intention of CPA	Rejected
A/TM/399	Tuen Mun	Small house in GB	(i) Degradation of value and function of GB	Rejected
A/ST/703	Sha Tin	Private garden in GB	(i) Degradation of value and function of GB (ii) Clearance of natural vegetation	Withdrawn by the applicant
A/TP/447	Tai Po	Private garden in GB	(i) Degradation of value and function of GB (ii) Clearance of natural vegetation	Rejected
A/TP/448	Tai Po	Small house in GB	(i) Degradation of value and function of GB (ii) Clearance of natural vegetation	Rejected

Case No.	Location	Nature of application	Comments from EAP	TPB decision (as at August 2011)
A/SLC/111	Shan Shek Wan, Lantau	Sewerage pipe installation at CPA	(i) Clearance of natural vegetation (ii) Poor environmental performance	Approved with conditions
A/SLC/113	Shap Long, Lantau	Small house in GB	(i) Degradation of value and function of GB (ii) 'Destruction-first' approach has been taken	Withdrawn by the applicant
A/NE-KLH/408	Kau Lung Hang	Small house in GB	(i) Degradation of value and function of GB (ii) In close proximity to an ecologically important stream	Approved with conditions
A/NE-KLH/412-413	Kau Lung Hang	Small house in GB	(i) Degradation of value and function of GB (ii) In close proximity to a woodland and an ecologically important stream	Approved with conditions
A/NE-KTN/139	Ho Sheung Heung	Barbecue site in AZ	(i) An unauthorised development (ii) Subject area is a priority site for ecological enhancement under the new Conservation Policy (iii) Proposed use is incompatible with the nearby environment	Rejected
A/NE-TK/312	Shan Liu	Small house in GB	(i) Degradation of value and function of GB (ii) Not in line with planning intention	Rejected
A/NE-TK/313	Shan Liu	Small house in AZ	(i) 'Destruction-first' approach (ii) Within the boundary of water gathering grounds	Rejected
A/NE-TK/317	Shan Liu	Small house in GB	(i) Degradation of value and function of GB	Rejected
A/NE-TK/318	Shan Liu	Small house in AZ and Green Zone	(i) 'Destruction-first' approach (ii) Within the boundary of water gathering grounds	Rejected
A/NE-TK/319	Shan Liu	Installation of electricity sub-station in GB	(i) Seek clarification on potential tree damage	Rejected
A/NE-TKL/339	Ma Mei Ha, Fanling	Filling of lands in AZ	(i) Weak justification (ii) Adverse impact on the natural stream (iii) Strong objection by residents	Approved with conditions
A/YL-LFS/202	Mong Tseng Tsuen	Filling of land in GB	(i) 'Destruction-first' approach (ii) Drainage affected (iii) Function and value of GB affected	Rejected
A/SK-PK/177	Lung Mei Tsuen	Small houses in GB	(i) Clarify impact on woodland (ii) Function and value of GB affected	Approved with conditions

Abbreviations used: AZ – Agriculture Zone; CA – Conservation Area; CPA – Coastal Protection Area; DPA – Development Permission Area; GB – Green Belt; SSSI – Site of Special Scientific Interest; VZ – Village Zone.

Besides heading off new threats, biodiversity conservation in Hong Kong also requires repairing past damage through ecological restoration. To this end, our Native Tree Nursery supplied seedlings and saplings to non-governmental organisations (NGOs) and private companies for tree planting activities, as indicated below:

Organisation type	No. of seedlings donated	No. of seedlings sold
NGOs	1,771	8,023
Businesses	-	1,548
<b>Total</b>	<b>1,771</b>	<b>9,571</b>



## Engaging the Community in Conservation

We deliver programmes for groups who have a general conservation interest or a specific conservation need.

We seek to improve the ecological awareness especially of policymakers and practitioners who have an influence on nature conservation in mainland China to bring about understanding and merge complex environmental issues into policy guidance. Our article 'Today's choices for tomorrow's nature reserves' was published in the Mainland's Ministry of Environmental Protection's *World Environment* magazine, which reaches 15,000 people including many people involved in formulating environmental policy; in it, we challenged the country to think more carefully about the direction and priority given to **nature-reserve development**, and urged respect for the integrity of natural ecosystems. A similar exhortation, as well as much practical guidance, pervades our *Sustaining the Pulse* book on managing for biodiversity conservation in South China, available online and soon to be published in hard copy.

In June, the mainland China team organised an **eco-literacy training and ecological design** workshop in Hainan. Staff from Yinggeling and Bawangling Nature Reserves, teachers from local schools at Yuanmen, together with colleagues and interns with our sister organisation Partnerships for Community Development (PCD) attended the training, which blended emotional and scientific awareness of natural systems and environmental problems with practical farming techniques and permaculture concepts. Participants produced ecological designs for their workplaces: the nature reserve sub-stations, school gardens being integrated with the education curriculum, and small-scale farms across China where the PCD interns are stationed. In December, we concluded our pilot project with the **Green Ground Eco-Tech Centre** promoting urine-faeces separation compost toilets in mainland China. Two toilets were built by volunteers in farms in the Haidian district of

Beijing. These farms run an organic vegetable delivery service and provide small plots of land for citizens' kitchen-gardening, following the model of community-supported agriculture. The toilets serve as a practical facility as well as a demonstration unit for visitors. A resulting book, *Theory and Practice of Urine and Faeces Separation of Ecological Toilets*, was published in Chinese.



Explaining the effects of soil erosion on water content – ecological design workshop in Hainan.



A demonstration on how to build a 'compost basket' for a vegetable garden using kitchen waste.

Teachers around nature reserves have a big role to play in conservation. In June, our China team co-hosted a school activity with staff at **Yinggeling Nature Reserve's** Panyang sub-station in Hainan to raise its education profile in the community; some 50 local students learned about wildlife in Yinggeling. We have also conducted a number of conservation education activities in the schools themselves. In mid-January, Yinggeling and the mainland China team launched a collaboration with Yuanmen Primary School, one of the few provincial 'green schools' in Baisha County on environmental education. The first project was to produce a student field-study handbook encouraging local students, guided by their teachers, to explore for themselves aspects of cultural origins and connection with rainforests. A school vegetable garden originally set-up at Yuanmen

Middle School in November 2009 to integrate farming activities into their special local curriculum produced its first harvest in late January 2010. We also presented a talk on Hainan's wildlife to Baisha First Primary School in June.

It is increasingly recognised that conservation cannot take place in isolation from the wider changes in the environment and the economy. Issue No. 16 of our China conservation magazine **Living Forests** was printed in November with the theme of '**Building resilience to Peak Oil and Climate Change**'. Thematic articles explored the various links between tightening resource availability and energy limits (especially oil), recent economic crises and the state of the environment, indicating conservation can only be effective as part of a far-reaching transition to ecologically-based lifestyles.



Senior Officers, Dr Michael Lau and Paul Crow having a discussion on the conservation of Golden Coin Turtles.



Dr Michael Lau facilitating close contact with a live Corn Snake at the Snake Workshop held in Macau.



A Leopard Cat prior to release in her temporary enclosure on the KFBG hillside.



Katie, the Black Kite, has become very popular with our visitors and she has been involved in numerous educational activities such as Keeper's Talks and Nature Fun Days.

The media can play a big part in public engagement on conservation. The local Hong Kong broadcasting station Radio Television Hong Kong (RTHK) completed filming a documentary about the KFBG **Wild Animal Rescue Centre** in December 2009. Several staff of the Fauna Conservation Department were filmed going about their normal work activities. The documentary was part of a series of 'Hong Kong Stories' and was broadcast on Monday, 11<sup>th</sup> January, on ATV world (Chinese). KFBG also received the final aired version of a French wildlife programme that had previously been filmed in 2009. This wildlife documentary 'Guardians of Nature' highlighted the **Golden Coin Turtle conservation** work being jointly undertaken by KFBG and AFCD in Hong Kong. Our consultant, Dr John Fellowes attended a short training on **conservation film-making** in October in the UK, and shared the film-making techniques learnt with staff in December.

Website updates in 2010 included ongoing monthly highlights of interesting animal sightings on the KFBG hillside in Hong Kong; the Animal Keeper's Diary included an entry on the captive Leopard Cats. Other articles included the radio-tracking of a rehabilitated Brown Wood Owl, and features on Katie – the Black Kite, who may be the oldest bird of this species in captivity (24 years) anywhere in the world, and the Golden Coin Turtle which continues to live a precarious existence in the wild in Hong Kong. We are reviewing how to make better use of the engagement opportunities provided by the Internet.

In 2010, the Hong Kong Science Museum held an exhibition entitled **Biodiversity in Hong Kong**. Our Fauna staff collaborated with WWF Hong Kong to produce material for the display, which was on show to the public for five months.

Photographs and captions were provided to introduce the diversity of local fauna and flora.

A **herpetological field-training** day took place on our hillside, as part of a University of Hong Kong (HKU) course for biological science students. Staff of the Fauna Conservation Department presented talks and mentored the students during the fieldwork. This is the second year of this collaboration between HKU and KFBG.

Flora Conservation staff gave presentations to secondary school students and undergraduates concerning our plant conservation programmes. At the invitation of the **Civic and Municipal Affairs Bureau**, Macau, the Fauna conservation team together with the KFBG Education Department organised a **Snakes in Macau** exhibition at the **Parque de Seac Pai Van Nature Education Centre** on Coloane Island from April to August. A public seminar and two workshops about snakes were also held in Macau in April, for teachers and family groups. More than 250 teachers and members of the public joined these programmes. In November, the Fauna team's education officer, Wing Tsui attended the 18<sup>th</sup> Annual Southeast Asian Zoos Association Conference in Bali, Indonesia, and gave a presentation on 'Re-connecting People with Nature'.

On occasion, we can contribute to research on the effectiveness of conservation engagement by different approaches. An example in 2010 was a study on how a visit to KFBG influenced the values of visiting students (Lee & Grace 2010. *Journal of Biological Education* 44: 156-165).



# MINIMAL ECO-FOOTPRINT

The KFBG Goal for Minimal Eco-Footprint is: Minimal environmental damage and maximum resilience. Efficient use and recovery of resources. The social and ecological benefits from KFBG's on-site operations are maximised in the context of the challenges posed by Peak Oil and Climate Change.

*At the KFBG site in Hong Kong we strive to eliminate the negative environmental impacts of all our operations. We source local and seasonal*

*vegetables for our staff canteens, and, as from this year, we no longer serve beef. We are also gradually reducing our carbon emissions from vehicle usage by driving less, car pooling, setting fuel budgets and using biodiesel for some of our vehicles. In terms of our facilities, we have installed effective water sterilisation and filtration equipment to our water distribution systems to enable drinking of our stream water by staff and visitors. We upgraded our existing solar street lighting with LED bulbs, installed four new solar heaters and several green roofs. In terms of our organic resource recovery, we have improved the internal cycling of materials including roadside leaf-litter and cut wood from both our tree maintenance operations and from trees damaged by storms. We have also initiated trials on biochar production using various types of waste wood materials.*



A view of the green roof and green walls at the male public toilet facility at the KFBG site in Hong Kong.



A view of the green roof on top of the Insect House at KFBG.

## Buildings and Energy

KFBG is committed to reducing the energy demand of its Hong Kong site facilities as a model for the changes needed in society. This is a challenge for us; due to our expansion and development over the last decade, we now consume much more electricity than we used to over 10 years ago. A working group has been formed to explore ways to reduce electricity consumption – from the grid and overall – and to increase our use of renewable energy. In 2010, the Facilities Department upgraded our existing solar street lights, using more effective and energy-efficient LED lights. We also installed four new solar heaters, at the Conservation Building, Amenities Building and Maintenance Workshop.

Green roofs not only soften the appearance of buildings but have other functions including insulation and providing a habitat for insects. We installed several green roofs in 2010: at the Insect House, the public toilets and the shelter outside our main office buildings. We also experimented with different types of 'green wall' installations at the public toilets. More green roofs will be built, to save energy through better insulation of the building fabric.

## Cutting the Food Footprint

We are always seeking more local and environmentally-friendly sources of food, for our canteens and the new, vegetarian, Sun Garden Cafe. The biggest **ecological footprint** in food consumption comes from eating meat; cattle-farming is especially destructive due to the high demand for land for fodder and grazing, and, the methane that is subsequently produced by cattle. In July, we took a step forward when we decided to no longer serve beef in our staff canteens.



'No-Beef' Poster for the KFBG Staff Canteen.

Our vegetarian-only day (every Friday) has been a mixed success, with some staff opting out on days when vegetarian-only food is served. From this year rather than increase the 'no-meat days' we have sought to reduce the overall meat content of meals served.

To minimise carbon footprint, food served in the canteens are 'in-season' and either grown on site or bought from local markets and organic farms. We support suppliers like the **Hong Chi Association** (formerly known as The Hong Kong Association for the Mentally Handicapped) in Tai Po which carry out ecologically-friendly farming. From June, we entered into an agreement with the Association to supply seasonal vegetables to our canteens.

## Greening Goods and Services

When procuring goods and services, all departments of KFBG are expected to give reasonable preference to suppliers who are part of a more sustainable local economy. This also applies to goods sold in the Farm Shop – this year, we sold 2,170 pot-plants produced by sustainable methods on-site. In the coming year, the Farm Shop will sell home-made snacks, prepared in the cafe, in place of packaged food. We also plan to expand our range of books that introduce and encourage sustainable, low-carbon living.

## Recovering Organic Resources

In June, we introduced a new **biochar machine** to enhance our capacity in plant waste recovery. This technique (gaining increasing attention as a means of carbon sequestration) heats wood biomass by pyrolysis in the absence of oxygen, and converts it to charcoal.

It helps convert plant waste material of poor quality into a useful resource; bamboo biochar, for example, can be a good humidity regulator and deodorant, and is now sold in the Farm Shop. An early hitch in operating the machine has come from the high moisture content in the wood. We have resolved this by making a D-I-Y solar dryer using waste material to treat the raw wood. We use only low-grade cut wood with no other useful purpose for this process. We now have student interns helping to document the biochar-making process for different kinds of wood materials and products, and will share our experience with other organisations.

The Flora Conservation Department work teams sweep up and collect fallen roadside leaves, each week, for use by other

departments. In 2010, about five tonnes of leaves were used by the Fauna Conservation Department for animal husbandry, and by the Sustainable Living & Agriculture Department for mulching (covering soil to protect it and reduce water evaporation) of our vegetable gardens.

## Transport

Various efforts are on-going to reduce the carbon footprint and fuel usage of our **fleet of vehicles**, including a fuel-use budget for each vehicle, use of bio-diesel from waste cooking oil in some vehicles, an inter-departmental car pool, and gradual replacement of old or inefficient vehicles with the most fuel-efficient, environmentally-friendly and cost-effective options available. Our two mules also play a part; during 2010, they made 77 trips up the mountain, shifting some 1,264 loads

of seedlings, rubbish, compost and other items weighing a total of 7.2 tons. Vehicles also present a surface that receives light and heat: a resource! Thus, our rubbish collection truck has now been fitted with a custom designed green roof-rack, growing cover plants and herbs.



Green roof-rack installed on the cab of our rubbish collection truck.

## Water

**Water sterilisation systems** were installed at the Reception area, the Operations Office and the Education Department workshop. Besides the on-going upgrading of the water distribution network, two sets of industrial-type **sand and carbon filters** were installed to pre-treat the stream water, resolving earlier problems with clogging of the water dispensers by particulates. Monitoring of the water quality 'before' and 'after' installing these items of equipment revealed satisfying results, and we continuously keep a close

watch on water quality. Most of the drinking water we use is now being pre-treated before it reaches the sterilising and filtering equipment. This has allowed us to greatly reduce the use of bottled water in our offices, and we no longer sell bottled water to visitors in our Farm Shop. Next year, similar sedimentation filters will be installed to cover the remaining areas of KFBG.

To further improve the management of effluent from our animal holding areas, new **sewer drains** were installed to collect waste water from the aviaries and wild boar enclosure. The sewage will subsequently be treated by the Constructed Wetland Wastewater Treatment System, ensuring no discharge of effluent into the Lam Tsuen River.



Production of bio-charcoal from bamboo.



# HOLISTIC ESTATE MANAGEMENT

The KFBG Goal for Holistic Estate Management is: Harmony between the core functions of the KFBG site (Conservation, Food Garden, Aesthetic/Spiritual and Education). The contribution of the site to all of these functions is fully realised. Safe, efficient, user-friendly operations.

*An integrated Land Management Plan is being developed to international standards, aided by the use of new Geographic Information System map layers. Work to diversify the native flora of the forest at KFBG continues; in April, staff planted tree seedlings of 17 species, mostly around the Lower Farm. New ecological pest-control measures include the use of Neem Oil in the orchid collection, sealing the Seed Bank against rats and selective use of fencing to minimise mammal damage to orchards and plants. Meanwhile, a lot of work went into improving the stability of slopes; upgrade buildings and roads for safe and effective operation. Our knowledge of the fauna gradually improves: over 1,400 moth species are now known from the KFBG estate – Hong Kong.*

## Land Management Plan

A process is underway to produce an integrated Land Management Plan for the KFBG Estate, with management objectives clearly set-out on a zonal basis. The Plan will guide ecological restoration including tree planting. In order to help co-ordinate information on the different functions and attributes of the Estate, an inter-departmental GIS (Geographic Information System) Working Group was formed early in the year. Initial zoning has been made with reference to IUCN Protected Area management categories and other standards. The system shows up features relevant to conservation and planting, such as land use, production and display areas, heritage trees and terrace walls. The basic GIS site map, as shown, is one example of the many layers that we use for the illustration of features within the KFBG site.

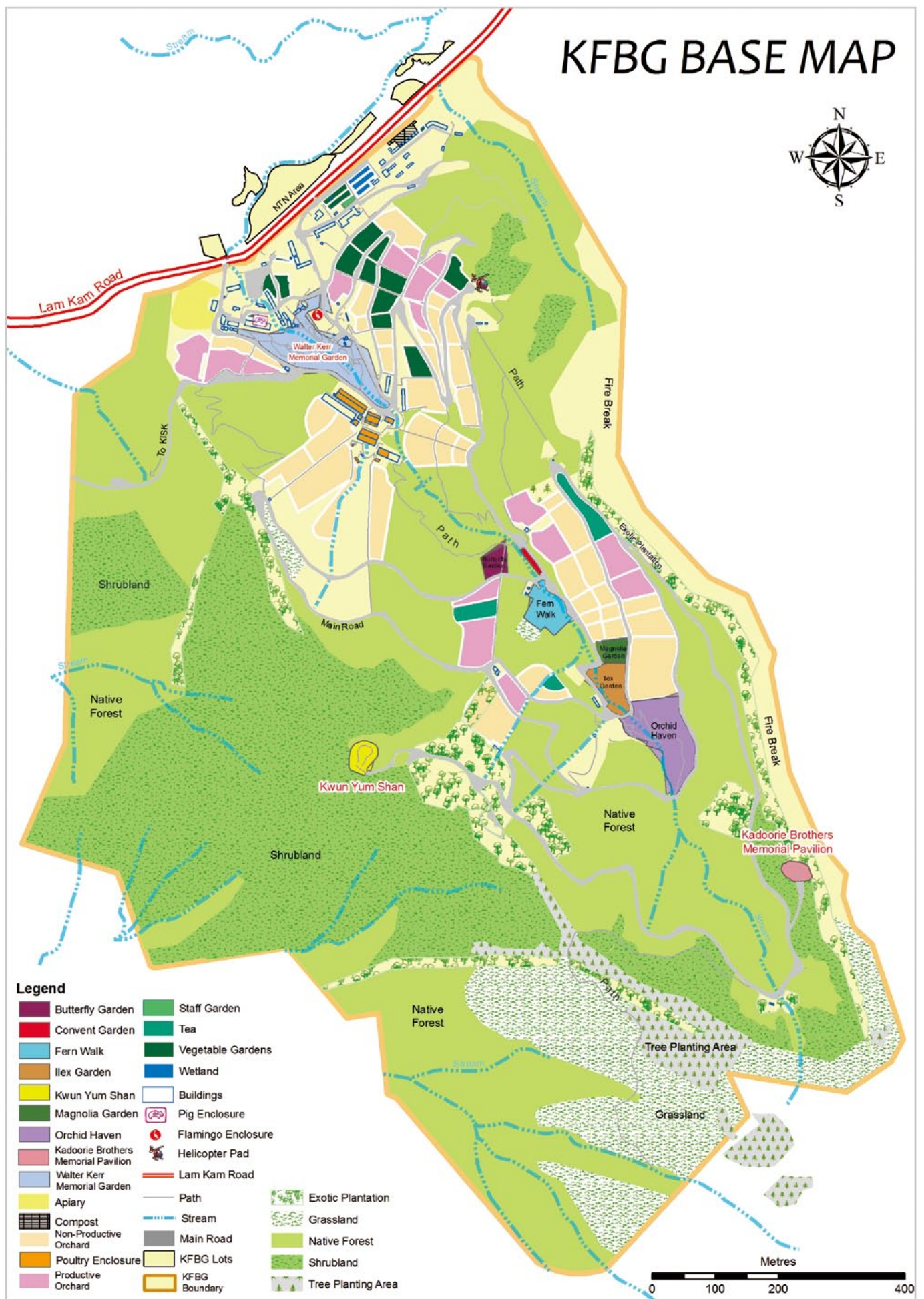
## Ecological Integrity of the KFBG Estate

The KFBG hillside combines beauty with multi-functionality and we believe they should go hand-in-hand. Besides measures reported under the 'Visitor Experience' (see Holistic Education), other steps are being taken at improving the ecological integrity, so that the flora and fauna of the site is closer to that of natural ecosystems. In April, a **staff tree planting activity** was organised and the Native Tree Nursery supplied 680 seedlings representing 17 species, which were planted at various places within KFBG.

Following our promising early trials of green roofs and walls, we have resolved to ensure that they serve multiple functions including habitat for invertebrates, for aesthetic enhancement and for insulation of buildings. Whenever possible, native plants are preferred for planting on these roofs. We continue to introduce measures to improve the continuity of the stream habitats. While



KFBG Staff planting trees on Earth Day, 22<sup>nd</sup> April, 2010.





the existing dams and drainage channels are necessary for water distribution, irrigation and drainage, we will continue to add animal-friendly features such as bridges, tunnels and turtle ladders, which have proven effective in allowing this group of animals to move up and down along the stream course and across the hillside.

A key aspect of ecological integrity is to limit and reverse the spread of invasive alien species. We are exploring ways to reduce the abundance of the climber *Mikania micrantha* (Mile-a-minute Weed), and to replace the exotic *Lantana* shrub, which has benefits to native butterflies as a source of food, with alternative native plant species. We also remain vigilant against the invasive Red Fire Ant, which has been recorded in land adjacent to KFBG.

We are always seeking ecologically-benign means to resolve pest issues. Our consultant horticulturalist, Mark Issac Williams has introduced the use of **Neem Oil**, a natural product extracted from the tropical tree *Azadirachta indica* (Neem Tree), to control insects and fungal pest outbreaks within our orchid collection. As a natural product, its impact is not as immediate as chemical control agents but its efficacy is already being observed especially in controlling fungal rots.

Our KFBG site, which is rich in wildlife, is prone to **animal conflict** issues, with organic farming and captive animal facilities being attractive to wild and feral animals. A wide variety of pest management issues come to light every year, and imaginative solutions are required to resolve them without major expense. **Macaques**, in particular, can be very difficult to manage in an area containing orchards and vegetable gardens. A small troop of four to five wild Rhesus Macaques spent a good part of the year in the Lower Farm, causing damage to some of our displays. Our Fauna team was on call to respond should any staff or public need assistance, but patience with the animals seems to have paid off and there were no significant concerns. The use of safe electric fencing seems essential in some of the vegetable gardens to keep out wild boars and macaques. A co-operative plan with AFCD has been underway in order to

address repeated sightings in the Upper Farm of **feral dogs** which have been responsible for the deaths of several Wild Boar, Porcupine and Barking Deer. The dogs are very elusive as they tend not to stay in one place for long. A small-scale **rat** trapping exercise was launched in the Seed Bank to monitor the scale of rats developing into a potential pest problem in the building. After inspection prompted by complaints about rat activity and odour, additional work to seal the building envelope was recommended. Determination of the success of the barrier methods employed will be monitored by use of traps after completion of the work. A series of site visits through June and July were required to investigate recurrent plant damage by **Wild Boar and Porcupines** at Orchid Haven and to seek solutions to the problems. An installation of fences that makes use of existing barriers was recommended to minimise this problem.

We continue to build-up our knowledge of the wildlife that can be found on our site. Moth surveys conducted monthly found 50 species that were new to KFBG and several species new to Hong Kong. The total number of individual moths recorded on the KFBG hillside now exceeds 16,000, with at least 1,421 species recorded. Moths are indicators of environmental change and through this long term study we may be able to detect changes



Wild macaque scavenging a leftover drinks carton.



Macaque-damage of long beans at KFBG.



Macaque-damage of the corn crop at KFBG.

in species composition related to changes in climate. In the meantime, the Flora Conservation Department is compiling an updated plant database to assist with future landscape management decisions.

To protect the KFBG site in the event of hill fires, we cleared the grass and undergrowth from the fire-break zones in October.

### Estate-related Safety and Maintenance

The Facilities Department played a major role in maintaining and improving the **infrastructure** of the KFBG Estate, upgrading roads, buildings and slopes and testing the stability of the power-distribution system in meeting current standards. The first phase of our slope upgrade plan was completed, with slopes beside the Chicken Houses, Kwun Yum Garden and vegetable-sorting area being stabilised. We have inspected over 250 slopes and features on the site and upgraded 15 since 2005. Preventive maintenance and engineer inspections of various slopes and retaining walls are on-going as part of our daily operations. Major buildings or areas renovated included the public toilets, Eco-garden, Orchid Haven, greenhouses, Native Tree Nursery and Plant Conservation Laboratories.

In February, the renovation of the mule stable and exercise yard were completed, and, the mules returned from their temporary home at the Pat Heung Horse Riding Club Ltd. The mules appeared happier with their larger (doubled in size) exercise yard.



Dennie, one of our mules in his exercise yard, interacting with a young visitor.

The Facilities Department also responded to over 1,500 **repair-and-maintenance** requests and 125 small-scale **capital-work** requests during the year. In the interest of staff safety, the flight test cage in the Wild Animal Rescue Centre was modified in October with a new winch system to raise and lower the cage netting, to avoid storm damage during inclement weather. We made other improvements at the snake-handling room, quarantine cages, Monkey Haven, the Native Mammal Display and Reptile Garden.



KFBG's Tree Management Team cutting down a dangerous tree.

In areas accessible to the general public, the health of the overhanging branches of trees is monitored and the **Tree Management Team** carried out 119 operations throughout 2010, removing 64 hazardous trees and pruning 174 others. Three of the staff received in-house training on tree work in late summer and they became tree team members in September.

To enhance **visitor safety**, all General Administration officers and security staff have been trained to operate an Automatic External Defibrillator which was purchased in 2010, and over 50 staff also have received First Aid Training, to deal with basic emergency situations arising at the KFBG site.



# AN EVOLVING ORGANISATION

Goals: KFBG seeks to have an organisational structure and systems that evolve to meet the needs of the people, goals and strategic directions. This includes a sense of belonging to a positive movement with shared core values, mission and vision, and achieving strength through adaptive learning, diversity, teamwork, commitment and ownership.

All staff and volunteers at KFBG recognise themselves as change agents, and have the necessary attitude, knowledge, skills and commitment to achieve our goals whereby individual values are aligned with the organisation. As an institution, we comply with laws, international standards and our own KFBG policies and we have secure funding that is prudently deployed and aligned with our strategic directions.

*The organisation's work and reporting is steadily being aligned with the latest KFBG Strategy and the format of this Annual Report is the first to be organised by strategic goals rather the traditional layout of reporting according to our departmental structure.*

*In April, Dr Bosco Chan became Head of the China Programme. In August, Dr Gunter Fischer joined KFBG as Head of the re-vamped Flora Conservation Department and the Orchid Conservation Section was re-integrated back into the department. Inter-departmental forums to oversee the key strategic goals are developing as a new way of conducting our work as are working groups. We are exploring ways to actively develop the sense of belonging and commitment of the broader KFBG team.*



A volunteer creating signage on a woodblock for a display in a greenhouse.

## Dynamic Structure

An organisation such as KFBG cannot stand still. Building on the external and internal reviews of our effectiveness in the previous year, the latest **KFBG Strategy** is gradually helping to direct priorities and improve understanding of the organisation's wide-ranging and often complex work. From this year, internal reporting to the Board of Directors, and this Annual Report, have been structured to align with the Strategy rather than by department.

In April, Dr Bosco Chan took over as the Head of the Mainland China Programme, following Dr Michael Lau's decision to step down and spend more time working for KFBG on conservation issues in Hong Kong.

For management reasons, the KFBG Orchid Conservation Section had been under the interim administration of Dr Chiu Sein Tuck, Head of the Education Department since January 2008. With the arrival of Dr Gunter Fischer as Head of the **Flora Conservation Department** on 2<sup>nd</sup> August, 2010, the Section was transferred and re-integrated back under the management of this department. The scientific underpinnings of the flora conservation work have been greatly strengthened during the year and with the recruitment of several very knowledgeable



Our volunteers helping to create plant labels.



Working with soil is always a delightful experience for our staff and volunteers.

A quiet background role important to KFBG's effectiveness comes from the **Information Technology** section of the General Administration Department, which maintains the electronic hardware, software and information technology networks. This year, the section has implemented a 'PaperCut' printer monitoring system in the General Administration office, attended GIS on-line training, and installed various new network connections and

and experienced staff, this building-up of the Flora team will continue for some time in the future.

projector facilities as well as doing a lot of 'troubleshooting' to keep those 'electric brains' up and running.

While KFBG's departments have considerable operational autonomy, there is often a need for integration between them, and inter-departmental co-operation has improved during the year. Inter-departmental **forums** are gradually being set-up to oversee implementation of the key strategic goals, beginning with forums on Minimising Ecological Footprint, Sustainable Living and Holistic Estate Management. These forums sometimes appoint working groups, to explore fine detail, solve problems and address any blockages. The forums recommend actions to the Management Team, who implement these through their departmental line management.

## Vibrant Culture

It is important to KFBG's challenging work that the staff, volunteers and partners have a sense of **belonging and commitment** to our mission, vision, core values and strategy. The means by which we optimise this role include producing four issues of our *Connections* newsletter each year, showing who we are and what we are trying to achieve and sending these to our staff and the Friends of KFBG. To foster staff interaction, regular monthly 'sharing' sessions, to build-up internal understanding of our diverse and meaningful activities are being launched.

Several departments had **team-building** activities. In September, our Mainland China Programme team had a brainstorming seminar/workshop up in the mountains at the Diaoluoshan National Nature Reserve, Hainan. The Fauna Conservation Department team visited the Hong Kong Zoological and Botanic Garden. The Flora Conservation Department held an informal dinner in December, and has also designed a new departmental logo and fieldwork uniforms, to improve identity and recognition when working out in the field.

## Great People

KFBG's effectiveness depends upon a talented and dedicated pool of staff. During 2010, 24 **new staff** joined the organisation. In some areas, such as animal husbandry and ecological agriculture, local recruitment of sufficiently skilled staff is still difficult. Twenty-six staff left the organisation, including the long-serving Judy Kiu (16 years) from the Education Department; we thank them all for their many and varied contributions, and wish them well.

We welcome opportunities to improve the skills and abilities of our team. A number of staff attended a residential course led by Dr Satish Kumar of Schumacher College, UK, based at KFBG and the Kadoorie Institute Shek Kong in March. The course covered various aspects of connecting with nature and was also an opportunity to experiment with a course design for our future workshop programme at KFBG.



Dr Satish Kumar.



A group photo of KFBG staff and partners with Satish Kumar, March 2010.





Participants of the Botanic Garden Management Course in Singapore – group photo taken at Sungei Buloh Wetland Reserve.

Drs Chiu Sein Tuck, Stephan Gale and Charlotte Shiu attended a **botanic gardens management** training course, organised by Botanic Gardens Conservation International (BGCI) and the Botanic Gardens of Australia and New Zealand (BGANZ), at the Singapore Botanic Garden in March.

Fauna staff members were encouraged to find online training on animal conservation and technical skills due to the lack of training opportunities, locally. Supervisor Eric Lee achieved a grade of 99% in his assessments for a **wildlife rehabilitation** online training programme, which he completed in November. Flora staff took part in conferences in Taiwan on **horticultural therapy** in May, and on arboriculture in

USA in July, as well as Hong Kong meetings on Climate Change, **arboriculture**, tree pathology, tree preservation and tree risk assessment. Several Flora staff received training in GIS software, horticultural therapy, herbarium techniques and seed banking. In-house training was also provided to Flora work teams in tree work and horticultural techniques. In December, Flora staff joined the Mainland China team on a field trip to Hainan to gain exposure to key conservation sites.



Visit to National Taiwan University during a study trip to Taiwan – planters for Horticultural Therapy.



One of our volunteers providing a guided tour for our visitors.

Bus Interpretation Service, fieldwork assistance, woodwork, working with animals, the Hong Kong Flower Show, and a great deal of outreach work on Sustainable Living. Their willing participation, amounting to over 10,000 service hours in 2010,

is key to the success of many of these activities. When possible, we run team-building activities that celebrate and encourage participation; at one such event volunteers designed and painted the names of plants onto stones, which are now being used as plant labels in the Fragrant Garden.

## Standards Compliance

KFBG's role in Hong Kong society is established by a unique ordinance,

and we take great care to ensure **compliance** with laws and regulations here and in Mainland China. We also periodically update our internal policies and ensure compliance to these. We also seek to uphold international standards for conservation.

## Financial Prudence

Each dollar spent by KFBG is in support of the mission, and independent **auditing** ensures our accounts are kept in good order; the audit for the year ending 31<sup>st</sup> March, 2010 was carried out in early September. PricewaterhouseCoopers conducted the 2010 annual audit for KFBG's Occupational Retirement Scheme and concluded proper accounts and records were maintained in relation to the contributions. The annual budgeting exercise for Financial Year 2011-2012 and the revised Five-year Plan was carried out in October and November. We thank the Trustees of the Kadoorie Foundation for their trust and their continued support of the work of KFBG. We also thank public and Government donors for their contributions to our programmes.

# KFBG Organisation



Note: \* As at 31<sup>st</sup> December, 2010



## 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**

Education Department

***Dr. Chiu Sein Tuck***

Facilities Department

***Denis Ng***

Fauna Conservation Department

***Dr. Gary Ades***

Flora Conservation Department

***Dr. Gunter Fischer***

General Administration Department

***Florence Au***

China Programme

***Dr. Bosco Chan***

Sustainable Living & Agriculture Department

***Idy Wong***



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