

森林 Living Forests 脉搏

华南生物多样性保育杂志
A magazine for biodiversity conservation in South China



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COUNTDOWN
2010
SAVE BIODIVERSITY

"倒時計2010"行動
Countdown 2010 in China

保育先驅：吳名川
Conservation Pioneer: Wu Mingchuan

中國項目十周年回顧
China Programme Tenth Anniversary



黄眉鹎
Narcissus Flycatcher
Ficedula narcissina



狭口食蚜蝇
Hoverfly
Asarkina Salvine

关于本园

嘉道理农场暨植物园(本园)位于香港最高山脉大帽山(957米)北坡下。园内清溪汇流,翠林环抱,还有不少果园和梯田,以及各种保育及教育设施。

今天的嘉道理农场暨植物园是一间独特的公私营合作机构。在1995年1月20日,立法局通过嘉道理农场暨植物园公司条例(第1156章),本园正式成为保育及教育中心。本园虽为公共机构,但经费是来自私营的嘉道理基金。

自1995年起,本园致力于推广香港和华南地区的保育及永续生活,并推行各类计划促进动植物保育和有机农业。

本园的使命是「本园致力提高大众对人与环境关系的认识,透过保育和教育,积极改善世界」。

中国项目

1998年,本园开展「华南生物多样性保育计划」,悉力保育广东、广西及海南三省幸存的天然林。我们的工作包括在华南60多个森林地区进行快速生物多样性调查,从而更透彻了解众多物种栖息的地方、这些物种如何在现今环境下存活以及它们面对的威胁。只有充份掌握这一切资料,我们才可以更妥善地保护他们赖以生存的土地。

2003年,「华南生物多样性保育计划」正式改名为「中国项目」,工作重点也从资料搜集转化为实际行动。我们从多角度审视问题,采取有效的行动保护自然森林和濒危物种,此外并教育农民有机种植的原理和方法,以及鼓励人们善用大自然慷慨赐予的宝贵资源:永续概念的精髓。

About KFBG

Kadoorie Farm and Botanic Garden (KFBG) is situated on the northern slopes of Hong Kong's highest mountain – Tai Mo Shan (957 metres). Within KFBG are streams, woodlands, orchards and vegetable terraces – together with conservation and education facilities.

KFBG, today, is a unique public-private partnership, incorporated and designated as a conservation and education centre by Ordinance (Chapter 1156) in the Legislative Council of Hong Kong on 20th January, 1995. While KFBG is a public organisation, it is privately funded by the Kadoorie Foundation.

Since 1995, KFBG has focused on promoting conservation and sustainable living in Hong Kong and South China, with programmes on flora and fauna conservation and the promotion of organic agricultural practices.

KFBG's mission statement is "We exist to increase the awareness of our relationship with the environment and bring about positive change in the world through conservation and education".

About the China Programme

In 1998, KFBG started the South China Biodiversity Conservation Programme, focusing on the remaining natural forests of Guangdong, Guangxi and Hainan. Our work included rapid biodiversity surveys of more than 60 forest areas in the region. These have given us a greater understanding of where many species live, how they are surviving in today's world, and what threatens their existence. Only with such understanding can humans take better care of the landscape on which their future depends.

By 2003, the renamed China Programme had shifted its focus from information-gathering to action. Our aim is to minimise the loss of biodiversity and encourage sustainability in China. Taking a holistic view of problems, we act to protect natural forests and endangered species. We also educate farmers about ecological principles and methods, and encourage people to use wisely the bounty of nature: the essence of sustainability.

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《森林脉搏》

《森林脉搏》为中英双语刊物，内容环绕华南地区的生物多样性保育。透过不同的新闻与专题文章，推动自然保育人士作经验分享和讯息、意见的交流，尤其是区内关注森林者。

About *Living Forests*

Living Forests is a magazine in English and Chinese about biodiversity conservation in South China. With news and articles, it encourages the exchange of ideas, experiences, impressions and information among nature conservationists, particularly those concerned with the region's remarkable forest heritage.



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Articles in *Living Forests* represent the personal views of the authors, and these are not necessarily shared by the editors or by KFBG.



海南钻喙兰
Rhynchosylis gigantea



Tetrathemis platyptera

主席寄語

有幸获邀为中国项目成立十周年撰贺辞，实在是荣幸之至。

还记起1997年初的某天，费乐思和侯智恒问我何有兴趣资助他们到广东和广西九个保护区进行考察，当时本园对华南的生物多样性一无所知（特别是在动物方面），他们岂不来得及，填补了这方面的空白？就这样促成了与华南农业大学、华南植物研究所和广东及广西林业局的合作，由本园的同事与香港大学的研究员及一众自然爱好者组成考察队，开始野外调查的工作。

其后随著多个保护区对调查结果的支持与赞赏，我们的工作得到肯定。于是，华南生物多样性研究队就在这样的情况下成立，昔日的经验亦造就了现在多个不同项目的开展。

华南生物多样性计划对本园的保育工作的影响深远，更扩阔了我们对国际领域的视野。队员的热忱与专业水平于本园一直发挥著启迪的作用。纵使保育事业荆棘满途，他们仍甘愿履行这份重要的使命，为著这份勇气我希望能在这里向他们表示由衷的感谢。

最后，我亦要向政府机构、学术单位或非政府组织的同业致谢，没有你们的支持，我们的工作是无法成功。在此祝愿我们日后都能同心协力，合作无间！

**嘉道理农场暨植物园主席
麦哥利**

A word from the KFBG Chairperson

It is with great pleasure and pride that I write to congratulate KFBG's South China Biodiversity Team (SCBT) on 10 years of excellent work and achievement.

In early 1997, I was approached by John Fellowes and Billy Hau and asked if KFBG would consider supporting a study of nine nature reserves in Guangdong and Guangxi. Given the apparent lack of up-to-date data on South China biodiversity (particularly fauna), it seemed like a good idea and the surveys were subsequently carried out by a team of KFBG staff, University of Hong Kong researchers and other naturalists from Hong Kong, in collaboration with the South China Agricultural University, South China Institute of Botany and Guangdong and Guangxi Forestry Departments.

The results of the study drew much interest and appreciation from various quarters, so it was clear that the surveys should continue. This led to the establishment of the SCBT and eventually, to the range of projects that comprise its work today.

The China Programme has played an invaluable role in broadening and deepening the conservation impact of KFBG – putting us clearly on the international map, so to speak. The enthusiasm and professionalism of the team have always been an inspiration and I offer my sincere thanks to them for having the courage and commitment to take on such a significant task, in spite of the difficulties and frustrations.

I would also like to thank our many partners in the government, academic and NGO spheres, who have helped to sustain this programme and make it a success – without you, none of the work would be possible. Long may our collaboration continue!

Andrew J.K. McAulay
Chairperson, KFBG



本期内容

2010年是各缔约国承诺大幅减缓生物多样性消失速度的限期，现距离完成目标的期限不到两年，加上2008年是中国的奥运年，在这历史性时刻，华南是否成功地保育了当地的天然遗产？2008年需面对更多的新挑战，包括变化莫测的冬季对森林生物多样性的影响——这还提醒我们破碎化生态系统当面对著气候变化之脆弱程度——此外，物价不断上涨对边缘化社区，不论是人或生物也会受到威胁。

2007年下旬举行的“2010年倒计时”启动会上，各与会者都认为有必要加快在中国的保育工作。在世界自然保护联盟中国办事处的协调下，廿所非政府组织已成为2010的夥伴。本园亦已成为其中一分子，更有幸与世界自然保护联盟中国办的奚夏珞小姐共同编纂本期以2010年专题的文章，她更亲撰中国保育概览一文，提醒保育人士2010年前尚未达成的目标。此外，夥伴的合作精神也在中国生物多样性保育蓝图计划中反映出来，这个系统性的地理分布是用以加强生态系统的保护，详情由大自然保护协会的Mike Heiner为大家解说。谈到物种保护，本园中国项目的刘惠宁提出以计算红色名录指数来评估物种灭绝速度。最后由同是中国项目的费乐思回顾在华南保育工作的成效——总结来说，仍有不少改进空间。

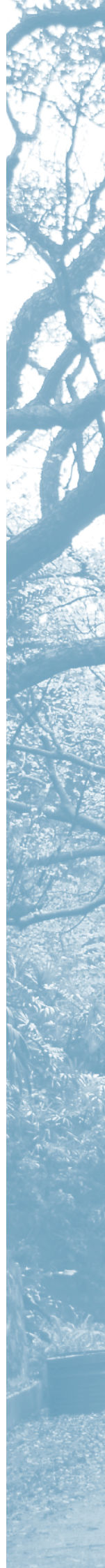
在反思2010目标之际，中国项目的成立不知不觉已有十个年头，费乐思与刘惠宁谨代表部门回顾过去十载的工作重点。而华南保育先驱一栏邀得了吴名川老师接受访问，他投身保育行列的年资是本部成立年期的五倍之多，由朱咏贤披露吴老师对广西森林的情意结。2005年奖学金得主之一的郑希龙会剖析海南黎族浓厚的民族植物学文化。珍稀物种小档案中介绍的冠斑犀鸟已临近濒危边缘，现已退到广西的一、两个分布点内栖息，而琼南属树种的繁衍或多或少也受制于动物是否能有效传播它们的种子。怪不得《不死的欲望》的作者也要提醒我们天然资源的重要性，更精彩的内容已转载到节录一栏。希望2008年能为减缓生物资源耗损树立一个更高的标准吧！

In this issue

This year we look ahead to 2010, by which time the world promised significant reduction in the rate of biodiversity loss. Two years to go: in this historic Olympic year, is South China winning the race to conserve its natural heritage? 2008 has already raised new challenges, including the unpredictable winter whose impact on forest biodiversity is barely understood – a reminder of the vulnerability of fragmented ecosystems against climate change – and soaring food prices that threaten marginalised communities, human and biotic.

Recognition of the need and resolve to step up conservation efforts in China was reflected in the launch of a Countdown 2010 Partnership in late 2007. Twenty NGOs joined forces, with the coordination of IUCN-China. KFBG has now joined this Partnership, and is proud to co-edit articles on this 2010 theme with IUCN-China's Charlotte Hicks, who kicks off with an overview of conservation in China, and a reminder of the 2010 targets as they're now defined. The cooperative spirit is embodied in the China Biodiversity Conservation Blueprint project, an initiative to boost ecosystem protection by systematic mapping, which is described by the Nature Conservancy's Mike Heiner. Meanwhile at the species level, Michael Lau outlines one promising area of assessing progress in extinction risk, the Red List Index process. Finally John Fellowes gives a subjective progress report on how well we're doing so far on the targets in South China – concluding we have plenty of room for improvement.

While we're in reflective mode, it's ten years since KFBG launched its China Programme. John Fellowes and Michael Lau review the focus during this first decade, on behalf of the many people who have contributed. The lifetime of the programme is put in perspective by an interview with Wu Mingchuan who has been engaged in conservation five times as long; in interviewing him for Conservation Pioneers, Wylie Chu unveils a lasting love affair with Guangxi's forests. In our Studentships corner Zheng Xilong examines the rich ethnobotanical culture of Hainan's Li Minority. In the Spotlight are the Oriental Pied Hornbill, regionally reduced to one or two refuges in Guangxi, and the slugwoods that remind us the fate of many plants hangs on that of their animal dispersers. No wonder our excerpt, from Andrew Beattie and Paul Ehrlich, reminds us of the central importance of natural capital. Let's hope 2008 raises the bar for slowing this capital depletion.



于海口举行的「华南野色」
图片展览
"South China Wild
Colours" photo exhibition
on view in Haikou



奖学金计划

由本园及海南师范大学合办，海南省林业局野生动植物自然保护中心协办，2007年度的嘉道理农场暨植物园奖学金活动已于2007年9月8-10日在海南省海口市顺利举行。为期两天的学术报告会中，除了13位2003-06年度奖学金得主的报告外，我们亦邀得三位嘉宾作专家报告，分别是海南师范大学生物系系主任史海涛教授、海南省野生动植物保护中心苏文拔主任以及本园顾问费乐思博士。不少海南师范大学的学生都前来参与报告，人数逾500人。报告会后，参加者前往海南师范大学保护馆、热带森林博览园和东寨港国家自然保护区参观，加深大家对海南省的自然教育与保育项目的认识。另外在海南师范大学校园内，同期展出一个主题为「华南野色」的图片展览，让当地学生及公众人士多了解及关注华南地区的生态情况。是次奖学金活动得到海南日报、海南电视台及广东电视台等媒体的报导。



史海涛教授进行专题报告 - 中国淡水龟的保育工作
Keynote talk by Prof. Shi Haitao on the conservation of fresh water turtles in China

今年奖学金计划共收到19份申请书，当中有八位获甄选接受面试后，三位学生获奖，详情如下：

姓名：王海京（硕士）
院校：华南植物研究所华南濒危动物研究所
研究题目：黑颈乌龟地理分布、种群现状及保育研究

姓名：刘恺（硕士）
院校：西南林学院保护生物学学院
研究题目：广西西北部河流水域生境破碎化对鱼类多样性的影响

姓名：李志刚（硕士）
院校：贵州师范大学地理与生物科学学院
研究题目：海南黑冠长臂猿种群社会结构研究

2008年度的嘉道理农场暨植物园奖学金现正接受申请。我们欢迎华南地区有意进行野生物种及生物多样性保育、永续农业或永续生活研究的全日制硕士及博士研究生申请奖学金。有关详情及申请表，请浏览本园网页 (<http://www.kfbg.org/kfb/introwithreport.xml?fid=165&sid=200&lang=tw>) 内的公布。截止申请日期为二零零八年七月十五日。

海南保护区前线职工的前瞻性项目

本园与海南林业厅合作，于2007年6月开展培训海南保护区前线工作人员的新计划，藉此积极推动及激励他们的工作。我们在芸芸40份申请书中，选出三个可获资助的项目，包括：茄新自然保护区的「海南稀有鱼类的保育」、南湾自然保护区的「旅游发展对猕猴生境的影响」以及尖峰岭自然保护区的「推动海南自然保护区的先进管理」。另外亦会向其他保护区提供环境教育及社区工作的培训。此外，我们将会资助来自两个保护区的职工进行生物多样性调查，亦会安排两个红树林保护区的人员到米埔自然保护区进行交流。

鹦哥岭培训班

由本园和海南省鹦哥岭自然保护区合办的「自然保护区巡护监测管理工作」培训班，已于2007年12月11至21日在海南白沙市顺利举行，是次培训的目的主要希望能提升海南省各自然保护区的管理水平及工作人员的巡护知



乘坐小艇参观东寨港红树林
The Studentships group visits
the Dongzhaigang mangroves
by motor launch

Studentships

In collaboration with Hainan Normal University (HNU) and Hainan Wildlife Conservation Centre of Hainan Forestry Department, the 2007 KFBG Studentship presentations were held at HNU from 8-10 September. Local students were welcome to attend, and some 500 people took part. The meeting featured progress reports by 13 current studentship-holders (2003-2006), along with keynote talks by speakers from HNU (Prof Shi Haitao), Hainan Forestry Department (Su Wenba), and KFBG (John Fellowes). Participants visited the environmental museums of HNU and Hainan Forestry Department, and Dongzhaigang National Nature Reserve. The "South China Wild Colours" Photographic Exhibition was held concurrently in the HNU campus to arouse interest from university students on the ecological situation of South China. The event was widely covered in the Hainan and Guangdong media.

Eight short-listed candidates for the 2007-2008 KFBG Studentships, out of 19 applications, were interviewed. Three students were awarded grants:

WANG Haijing (M.Phil.) of South China Institute of Endangered Animals, South China Institute of Botany is researching the distribution, current population and conservation of Chinese Black-necked Pond Turtle.

LIU Kai (M.Phil.) of the Faculty of Conservation Biology, Southwest Forestry University is studying the impact of habitat fragmentation in the northwest waters of Guangxi on fish biodiversity.

LI Zhigang (M.Phil.) of the School of Geographical and Biological Sciences, Guizhou Normal University is investigating the social structure of the Hainan Gibbon.

The 2008 KFBG Studentships are now open for application. We welcome applications from full-time Masters (M.Phil.) and Doctoral (Ph.D.) students within the area of biodiversity conservation and sustainable agriculture as well as sustainable living in southern China. Application details are available on our website (<http://www.kfbg.org/kfb/introwithreport.xml?fid=165&sid=200&lang=en>). The deadline for applications is 15th July 2008.

Proactive projects from frontline staff in Hainan

A new scheme to encourage initiative and motivation among Hainan nature reserve frontline staff was launched in June 2007, in collaboration with the Hainan Forestry Department. Forty applications were received and three projects were supported: "Conservation of a rare fish species in Hainan" by Jiaxin NR; "Impact of tourism development on the habitat of Rhesus Macaque" by Nanwan NR; and "Promoting advanced management for nature reserves in Hainan" by Jianfengling NR. Training courses on environmental education and community work will be organized for other reserves. In addition staff from two reserves will be supported to conduct biodiversity surveys, and staff from two mangrove reserves will go on an exchange visit to Mai Po Marshes Nature Reserve in Hong Kong.

Training at Yinggeling

Co-organised by KFBG and Yinggeling Nature Reserve (NR) in Hainan, a "Patrolling and Monitoring Management Workshop" for reserve staff ran from 11 to 21 December 2007. Aimed at enhancing the management level of the reserve and improving the patrolling skills of the staff, Dr Ramesh "Zimbo" Boonratana from Mahidol University in Thailand was the invited trainer.

The workshop included both theory and practice. Lectures attracted some 200 wardens from Yinggeling NR and several dozen wardens from 24 other reserves in



Boonratana博士对野外调查、保护区管理和人员训练均拥有丰富的经验，曾在老挝、柬埔寨、越南等国家的保护区进行相关的培训工作

Dr Boonratana specialises in field surveys, reserve management and capacity building of reserve staff, and has run training workshops in Laos, Cambodia and Vietnam

讲课部分在海南省白沙市的电影院内进行
Lectures were given in a cinema at Baisha City, Hainan



识，并邀得泰国国立玛希隆大学的保护区专家 Ramesh Boonratana 博士为这次培训的导师。

培训内容分为理论和实践两部分。第一部分的讲课，除了鹦哥岭自然保护区二百多名的护林员外，还有数十名来自24个保护区的护林员参加。Boonratana 博士以介绍世界各地保护区的分类、成立和管理，带出护林员工作的重要性，他们是保护森林的前线，任重道远。培训的内容还包括如何记录野生动物痕迹、测量树木、使用全球定位系统 (GPS) 和阅读地图等。其后有21位护林员更有机会到鹦哥岭自然保护区的南法岭进行5日4夜的野外实习，将先前在课堂学到的知识和技术应用于实际环境中，同时也藉此机会和Boonratana 博士交流野外工作的心得，参与训练的学员都获益良多。Boonratana 博士的豪迈作风和幽默的谈吐亦令大家印象难忘。Boonratana 博士对参与的保护区工作人员大为赞赏，认为他们态度积极，且学习能力十分高，并对他们能在深山中仍能准备美味的饭菜感到惊喜。此外Boonratana 博士在进行野外实习时看到不少人为的干扰，他体会到中国森林保护的迫切性，希望参与培训的保护区人员能学以致用，好好保护这一瑰宝。

工作概况

鹦哥岭村民初次设立禁渔区

应鹦哥岭保护区与本园之意见，海南南开乡道银村的村民于2008年1月决定在村附近设立禁渔区。本园早前得到晏阳初设计学院的实习生和社区夥伴的协助，在道银村进行建设深坑猪舍及堆肥旱厕的示范和培训，以改善当地卫生状况及养分回圈。这两个项目都相当成功，更令保护区、村民及本园建立了一种彼此互信的关系。我们现计划定期监测鱼类种群的变化，禁渔区有望成为其他社区的双赢经营示范。首个在五月于道银举办的教育活动中，向村民展示禁渔区内存活的大鱼，学童与记者亦有参与。

云南闭壳龟：真正濒危的物种

由于研究发现有些所谓稀有龟种是由杂交产生，云南闭壳龟 *Cuora yunnanensis* 的有效性一直受外界质疑。饶定齐博士向本园申请资助，成功获得数只圈养的闭壳龟，其中一只更于近日产下两卵。基因分析显示云南闭壳龟是一有效物种，可是却高度受威胁。野外考察将于初春再度进行，尝试寻找尚存的野外种群。

推广圈养山羊

2007年10-11月为农民、中国小母牛及牲畜养殖官员在菲律宾提供圈养山羊的培训。中国小母牛计划在云南建立山羊圈养示范，这种方法将大为减低比在脆弱生境放牧山羊对环境的影响。

海南黑脸琵鹭的数字上升

海南渡冬水鸟调查刚于2008年1月10-13日完成，是次选取了海南十二片湿地为调查地点，共录得51种水鸟。当中不乏惊人发现：在两片地区内发现93只黑脸琵鹭，是数量最多的一次，占全球种群的5%；此外也录得11只灰雁，是历次海南水鸟调查的新记录。

人事变动

萧丽萍女士于本年二月离职，虽然她在职时主要协助另一部门(植物保育部)的运作，但在中国项目成立初期也作出了不少建树。我们不会忘记她对兰花保育的热忱，在此亦顺祝她鹏程万里。

邓维杰自二月出任本园的兼职谘询顾问。他的丰富经验可有助我们了解国内复杂的社会经济状况，特别是鹦哥岭保护区周边的社区，以便制定有利于人与生物多样性的方案。



高峰小学40多位学生和10多名护林员一起参与鹦哥岭保护区的禁渔区活动

Some 40 students from a rural primary school at Gaofeng and 10 more forest wardens to take part in the Yinggeling Nature Reserve no-catch-zone activity.

Hainan. Zimbo briefed participants on the classification, establishment and management of nature reserves around the world, and the vital importance of the frontline staff. The workshop covered the basic skills of making and keeping records of wildlife signs, measuring trees, using GPS and reading maps. Twenty-one participants were selected to put theory into practice for five days in Yinggeling's Nanfaling area. Participants enjoyed the trainer's heroic style and sense of humour, while Zimbo praised the wardens' proactive attitude and quick learning, not to mention their cooking skills in a tough environment. Human disturbance was still evident in the forests and all their skills will be needed.



灰雁 Grey-lag Goose

In brief

Yinggeling residents start their own protected area

In January 2008 villagers in Daoyin, Nankai, Hainan decided to establish a no-fishing zone adjacent to their village, following the suggestion from Yinggeling NR and KFBG staff. The decision followed initial work by KFBG training villagers to build a pilot deep-litter bed pig raising system and compost toilet, improving sanitation conditions and nutrient recycling. Both of these, built with the aid of interns from the James Yen Rural Reconstruction Institute and Partnerships in Community Development (PCD), are working well, and have fostered a mutual trust between the NR, the village and KFBG. All parties now plan to monitor changes in the fish population, in the hope the

no-catch zone will provide a win-win model for other communities. A first celebratory event was held in May to show the large fish to villagers, inviting school-children and reporters.

Cuora yunnanensis: a true, truly endangered, species

For some time controversy has raged over the legitimacy of the Yunnan Box Turtle, following findings that some rare "species" were really hybrids. In a KFBG-funded project Prof Rao Dingqi has succeeded in acquiring several captive turtles and one of them laid two eggs recently. Genetic analysis has shown *Cuora yunnanensis* to be a good species, albeit a highly threatened one. Fieldwork will resume in spring to try and find a wild population.

Keeping goats out of the forest

Training on penned goat-keeping was organized for farmers, livestock officials and Heifer China staff in the Philippines in October-November 2007. Heifer China aims to build a demonstration in Yunnan of the penned goat system which is more environmentally friendly than open browsing of fragile vegetation.

Black-faced Spoonbill numbers rise in Hainan

The latest Hainan Winter Waterbird Survey was conducted on 10-13 January 2008, visiting 12 wetland sites. Some 51 waterbird species were recorded. Highlights were a total of 93 Black-faced Spoonbills at two sites – a record, and almost 5% of the world population. Also found were 11 Grey-lag Geese (*Anser anser*): a new species for the Survey.

Personnel changes

Ms Gloria Siu left KFBG in February 2008. Though mainly based in a different department (Flora Conservation) Gloria contributed to the China Programme especially in its early years, and her passion for orchids will be missed. We wish her well in the future.

Mr Deng Weijie joined KFBG as a part-time consultant from February. His great experience will help us understand the complex socioeconomic situation especially around Yinggeling NR, and help us identify solutions that benefit people and biodiversity.

中国发布《全国生物物种资源保护与利用规划纲要》

经国务院批准，国家环保总局于2007年12月7日，在北京发布了《全国生物物种资源保护与利用规划纲要》。

该《规划纲要》是由国家环保总局牵头，并由其他17个政府部门共同编制。《规划纲要》提出了加强生物物种资源的保育和持续利用的指导思想和原则。

更重要的是，它还订下了在2010年、2015年和2020年分三个阶段达到的短、中及长期目标。例如到2010年，中国就完成收集国内重要类型生物物种资源本底、建立物种资料库和资讯管理系统，以及改善生物物种资源进出口管理制度等目标。

此外，规划亦包括在未来几年将实施的10项优先行动和55个优先项目，如生物物种及遗传资源的编目和建立生物遗传资源利用与利益公平分享的法规制度等。

《规划纲要》是要促进人与自然和谐发展和利用科学创新和国家整体目标为依归。为实现这个有抱负的规划，下一步就得确保它能取得所需的资源和政治意愿去达成2010年的生物多样性目标。

感谢薛达元博士提供资料



细灰蝶
Zebra Blue
Leptotes plinius

峇里行动计划承诺整治气候变化与伐林危机

世界各国的领导人于去年12月在印尼峇里举行的气候变化大会，达成协议，共同制定「峇里行动计划」¹。自十年前京都协议书以来，有关全球气候的谈判一直处于胶著状态，直至最近美国、中国及印度共同签订该行动计划，紧张局势才告纾缓下来。计划的主要目标包括减排温室气体²，以免全球气候系统严重受扰，推动经济持续迅速发展及扶贫、协助贫穷国家保护其经济和社会免受气候变化的冲击等。临时工作小组将会在2009年达成一个详细的全球性协议，订立“可量度、可报告及可验证的”承诺来削减温室气体的排放量²。计划更呼吁把环保无害化技术转移予到贫穷国家¹。

计划内容包括考虑以政策和鼓励的手段，令发展中国家降低伐林与森林退化导致的碳排放（REDD）²；但推行政策时亦有不少挑战，例如：如何确定森林碳存量是否稳定、如何避免某一地区进行碳保存却引致其他地区出现伐林的情况、如何量度历来伐林的状况作为计算碳排放减少的本底数据、如何确保当地社区可从有权势的公司中享有公平待遇³——大部分保育学者均赞扬，由多个组织、政府机构及独立人士共同签署的「现在造林宣言」所作的努力和支援⁴。

资料来源：¹guardian.co.uk/commentisfree>Jeffrey Sachs, 26 December 2007. ²http://unfccc.int/files/meetings/cop_13/application/pdf/cp_bali_act_p.pdf. ³<http://news.mongabay.com/2007/1215-redd.html> ⁴www.forestsnw.org/

改善气候变化的最后机会

2007-2008《人类发展报告》¹指出就日益严重的气候变化问题引致人类发展的倒退，我们必须立刻采取相应的行动。希望政府部门明了富裕国家那刺激增长的经济模式及穷奢极侈的消费模式，在生态学角度上并不能持续。此外当中还强调寻求更实际的目标和多边框架更是当务之急，并要把全球变暖限制在较工业化前高两摄氏度的水平。

按现时的发展状况看来，在2032-2042年将会超出限制。要维持这个温度水平，必须订立一个稳定的目标，大气层中二氧化碳的总量最好维持在450 ppm (ppm=百万分之一)之内，同时亦要降低温室气体的排放量（自1990年的水平），分别在2020年及2050年前减排20-30%及50%。该报告亦呼吁各国通过可持续的碳预算及加强国际合作框架作缓减政策。这些亦须有能力应对市场失调的情况，如在印度尼西亚伐林所需成本最少为50-100美元（欧盟排放权交易计划的可交易碳价值），而利益却只有1美元（按棕榈油利润计算）。此外，全球都已承诺为廿一世纪上半叶的可持续全球暖化而作出努力，而推动气候变化的调适措施则会是2012年后京都协定的规范框架与国际扶贫合作夥伴的重点。

资料来源：¹United Nations Development Programme (UNDP), 2007. *Fighting Climate Change: Human Solidarity in a Divided World*. Human Development Report 2007/2008. UNDP.

慎重处理生物燃料的生产

英国皇家学会与经济合作与发展组织发表的生物燃料报告，在生产生物燃料前，应先基于

China's "Master Plan for conserving biodiversity"

After endorsement by the State Council of the People's Republic of China, on 7 December 2007 the State Environmental Protection Administration (SEPA) released the Master Plan for the Conservation and Exploitation of Biological Resources.

Although initiated by SEPA, the Plan has been formulated through collaboration with 17 other Chinese Government departments.ⁱ The Plan puts forward a guiding ideology as well as a series of principles for the conservation and sustainable use of biological resources.

Importantly, it also specifies goals to be met in three different phases: short-term goals up until 2010; medium-term goals to 2015; and long-term targets for 2020. By 2010, for example, the Plan calls on China to have collected baseline data about important species for conservation, to have set up a database and information management system, as well as to have improved controls on the import and export of biological resources.

Under the Plan, ten "priority" actions and 55 "priority" projects are to be implemented in the coming years. These include: compiling an inventory of species and genetic resources; and establishing a legal system for governing the exploitation and equitable benefit sharing of genetic resources.

The Master Plan is couched in China's overall goals of promoting balance between nature and human development and utilising scientific advances. The next important step for the realisation of this ambitious plan will be ensuring it receives the necessary resources and political will to contribute to achieving the 2010 biodiversity targets.

With thanks to Dr. Xue Dayuan for supplying this information.

Bali Plan promises action on climate change and deforestation

World leaders agreed to the Bali Action Plan (BAP) at global negotiations in Bali, Indonesia in December. The deadlock in global climate negotiations since the signing of the Kyoto Protocol ten years ago was finally broken when the USA, China and India signed up to the BAP.¹ The BAP addresses three key concerns: stabilising greenhouse gases to avoid dangerous interference in the climate system; allowing continued rapid economic development and poverty reduction; and helping countries adapt to the inevitable intensifying climate change. An Ad Hoc Working Group will reach a detailed global agreement by 2009 setting "measurable, reportable, and verifiable" commitments to reduce greenhouse-gas emissions.² The BAP also calls for knowledge transfer on environmentally sound technologies to poor countries.¹

The Plan includes consideration of policies and incentives for reduced emissions from deforestation and forest degradation (REDD) in developing countries.² While implementing REDD has challenges – how to ensure forest carbon savings are permanent; how to avoid carbon conservation in one area driving deforestation in another; how to measure historic deforestation as a baseline for calculating reduction; how to ensure local communities have a fair chance of benefits relative to powerful corporations³ – most conservationists welcome the effort, supported by the Forests Now Declaration signed by many organisations, governments and individuals.⁴

Source: ¹guardian.co.uk/commentisfree>Jeffrey Sachs, 26 December 2007.
²http://unfccc.int/files/meetings/cop_13/application/pdf/cp_bali_act_p.pdf.
³<http://news.mongabay.com/2007/1215-redd.html> ⁴www.forestsnov.org/

It's now or never

The 2007–2008 *Human Development Report*¹ gives a compelling case for urgent action to avoid the reversals in human development that will accompany projected

climate change. It calls on governments to recognise that the economic model driving growth, and the profligate consumption in rich nations that accompanies it, is ecologically unsustainable. It argues more realistic goals and a multilateral framework are needed, to establish a maximum threshold for dangerous climate change at 2°C above preindustrial levels.

Under present development scenarios this threshold will be breached between 2032 and 2042. Staying under the threshold requires a stabilisation target for atmospheric carbon dioxide (CO₂) of 450 parts per million, and a cut in greenhouse gas emissions (from 1990 levels) of 20–30% by 2020 and 50% by 2050. The report calls for policies for mitigation through sustainable carbon budgeting, and strengthening the international cooperation framework. These must address market failures that, for example, allow deforestation in Indonesia at a minimum cost of US\$50–100 (the carbon value if tradeable on the European Union's Emissions Trading Scheme) for a benefit of US\$1 (in palm oil revenue). The report also notes the world is committed to sustained global warming for the first half of the 21st Century, and that adaptation must be at the centre of the post-2012 Kyoto framework and international partnerships for poverty reduction.

Sources: ¹United Nations Development Programme (UNDP), 2007.
Fighting Climate Change: Human Solidarity in a Divided World. Human Development Report 2007/2008, UNDP.

Caution urged over biofuels

Reports on biofuels by the UK Royal Society and OECD call for balancing various factors in a coherent policy.^{1,2} Each biofuel should be assessed on its own merits, based on full environmental and economic life-cycle analysis.¹ Among present technologies only sugarcane-to-ethanol in Brazil, ethanol as a by-product of cellulose production, and biodiesel from animal fats and used cooking oil, can reduce greenhouse gases by over 40% compared with gasoline and mineral diesel, and their potential to meet the demands of the transport sector is very limited.²

一致政策^{1,2}衡量各项因素。评估每种燃料的优点时，需根据全面的环境与经济生命周期作分析¹。现有的技术中，以巴西种植甘蔗提炼乙醇的做法比较可取，乙醇是生产纤维素的副产品，而生物柴油是提纯动物脂肪和废弃的食用油，对比汽油和矿物柴油，它能减少超过40%的温室气体排放，可是它们能迎合交通工具对能源需求的潜力有限²。土地利用对环境、社会及经济的冲击必需作本土性及全球性的评估，土地用途的改变释出的温室气体足以抵销一切原有的气候功能，亦对生态系统的生物多样性及粮食的保障带来严重影响。现时全球谷物只有48%是直接供人类食用的，35%是供喂饲牲畜，另有18%是用来生产生物燃料的，强大的需求已把谷物的价格推向新高³。

资料来源：¹The Royal Society, <http://royalsociety.org/displaypagedoc.asp?id=28632> ²Doornbosch R & R Steenblik, 2007. *Biofuels: Is the Cure Worse than the Disease?* Organisation for Economic Co-operation and Development (OECD). ³Worldwatch Institute, www.worldwatch.org/node/5539#notes

可持续采集野生植物的最新指引

国际野生药用和芳香植物可持续采集标准是由国际保育联盟物种生存委员会 (IUCN-SSC) 的药用植物专家团、国际野生生物贸易调查组织 (TRAFFIC)、世界自然基金会德国分部及德国联邦自然保育署等组织协力制作，当中得到世界保育联盟加拿大分部的支持。应工业协会、政府机构、有机认证机构和从事资源管理及采集的人士的要求，该组织提供了芳香植物物种及其生态系统的管理原则与准则及管理规划指引、监测与汇报的基础、认证的相关条件。六项原则为：保护野外药用植物和芳香植物资源、防止采挖行为对资源和环境造成破坏、遵守法律法规与协定、尊重当地小区的传统使用权益、采取负责任的管理、开展负责任的商业活动。这个标准是及时性的，现存约50000-70000种的传统药用及芳香植物当中，有四分之一植物已因不可持续的采集模式而受危。早前起草的标准已于数个专案中进行试点，包括中国的王朗国家级自然保护区及白马雪山自然保护区管辖的国有林。

资料来源：<http://us.oneworld.net/link/gotoarticleaddhit/156313/7263/220995>; www.floraweb.de/proxy/floraweb/MAP-pro/.pdf

全球暖化令更多鸟类濒临灭绝

有关千年生态评估的生境消失预测及鸟类的海拔分布模型显示，若地球的表面气温上升2.8度，在2100年前，将会导致400~550种陆生鸟类灭绝，及令2,150种雀鸟受灭绝威胁。被预测将会灭绝的鸟种中，只有21%物种在现时被视为受威胁。作者指出须尽快针对有关物种的海拔分布变动进行高精度的测量。

资料来源：Sekercioglu C *et al.*, 2007. *Conservation Biology* (OnlineEarly Articles) doi 10.1111/j.1523-1739.2007.00852.x

中国斑鳖的状况

苏州一所寺庙的圈养斑鳖于去年八月死去，而专家们对越南河内的另一个体是否属同一物种一直有很大的争议。换言之，现时世界上的圈养斑鳖，仅馀雄雌各一只。湖南长沙动物园内的雌性斑鳖（约八十岁）和江苏苏州动物园内的百岁雄性斑鳖，已成为挽救这种世上最大淡水龟的最后希望。2008年春季将会对尚存的斑鳖进行人工授精。

资料来源：*New York Times* 5 December 2007.

厦门破获大型穿山甲走私案

福建省厦门市两名男子因非法进口穿山甲及其它动物被判处死缓，其他涉案人士被判以有期徒刑。2005年10月至2006年4月期间，该批不法分子共走私进口17箱穿山甲冻肉及穿山甲鳞片，另于2006年夏天充公了一个载有2,800只穿山甲的冻肉冷柜。

资料来源：<http://uk.reuters.com/article/environmentNews/idUKPEK19856420080110>

西双版纳毁林种橡胶正摧毁原始的生物多样性

据1976、1988及2003年的土地资源卫星影像，由于橡胶林的面积不断扩大，西双版纳的森林覆盖率已由70%降至少于50%，约1400平方公里的热带季节性雨林经已消失。由于海拔800米以下的橡胶林逐步扩大，令农业活动需往山上发展，间接造成了高海拔地区山地雨林和亚热带常绿阔叶林面积的减少。科学家认为可以就经济、社会及保育需求取得平衡，方法是确保800米以下的土地不能再新增橡胶林、保护剩下的每片森林，并将它们重新连接起来。此后若要开垦土地种植橡胶，只能局限于弃耕地或高地上的灌丛，另应在橡胶林内种植茶及其它林底作物，增进经济回报及减少水土流失。

资料来源：Li HM, TM Aide, Ma YX *et al.*, 2007. *Biodiversity and Conservation* 16: 1731-1745.

雀鸟分类的近期变更

一项对近期亚洲鸟类分类变更的回顾中，有部分变更是与华南鸟类¹相关。腹部呈灰色的东部大山雀 (*Parus minor*) 近日被提升为独立种，有异于黄色腹部的北部大山雀 (*P. major*)²。前者较常于林地出没，而后者则活跃于人类干扰较多的生境；中华攀雀 (*Remiz consobrinus*)²被认为是白冠攀雀 (*R. coronatus*) 的一个种群；异色树莺 (*Cettia flavolivacea*)³在印度支那北部及华南的种群已被归并入马氏树莺 (*C. vulcania*)，而异色树莺现时仅分布在喜玛拉亚。

资料来源：¹Collar NJ and JD Pilgrim, 2007. *Birding Asia* 8: 14-30. ²Eck S and J Martens, 2006. *Zool. Med. Leiden* 80-5 (1): 1-63. ³Olsson U *et al.*, 2006. *Molec. Phylogen. Evol.* 41: 556-565.

Environmental, social and economic impacts of land use should be assessed, locally and globally; changes in land use risk releasing enough greenhouse gases to negate intended climate benefits, as well as impacting biodiverse ecosystems and food security. Only 48% of global grain is now fed directly to humans, with 35% going to livestock feed and 17% to biofuels; strong demand has pushed cereal prices to new highs.³

Sources: ¹The Royal Society, <http://royalsociety.org/displaypagedoc.asp?id=28632> ²Doornbosch R & R Steenblik, 2007. Biofuels: Is the Cure Worse than the Disease? Organisation for Economic Co-operation and Development (OECD). ³Worldwatch Institute, www.worldwatch.org/node/5539#notes

New guidelines on sustainable collection of wild plants

A new *International Standard for Sustainable Wild Collection of Medicinal and Aromatic Plants* (ISSC-MAP) has been produced, by the IUCN-SSC Medicinal Plant Specialist Group, TRAFFIC, WWF Germany and the German Federal Agency for Nature Conservation, with support from IUCN Canada. A response to requests from industry, governments, organic certifiers, resource managers and collectors, the ISSC-MAP provides: a framework of principles and criteria for managing MAP species and their ecosystems; guidance for management planning; a basis for monitoring and reporting; and recommended requirements for certification. The six principles are: to maintain wild MAP resources; to prevent negative environmental impacts; to comply with laws, regulations and agreements; to respect local communities' customary user rights; to apply responsible management practices; and to apply responsible business practices. The Standard is timely: of some 50,000 to 70,000 medicinal and aromatic plants used, one-quarter could be threatened by unsustainable collection. A previous draft has been tested in various projects, including those in Wanglang NNR and Baima State Forest in China.

Sources: <http://us.oneworld.net/link/gotoarticle/addhit/156313/7263/220995>; www.floraweb.de/proxy/floraweb/MAP-pro/.pdf

Temperature rise will eliminate many more bird species

A model combining elevational ranges, Millennium Assessment habitat-loss scenarios, and an intermediate estimate of 2.8°C surface warming, projected 400–550 land-bird extinctions, and an additional 2,150 threatened species by 2100. Only 21% of species predicted to become extinct were previously considered threatened. The authors note there is an urgent need for high-resolution measurements of shifts in the elevational ranges of species.

Source: Sekercioglu C *et al.*, 2007. *Conservation Biology* (Online Early Articles) doi 10.1111/j.1523-1739.2007.00852.x

Turtle plight gets worse

The Yangtze Giant Softshell Turtle *Rafetus swinhoei* is now feared to number just two individuals, one male and one female, in captivity. The 80-year-old female in Changsha Zoo, Hunan, and the 100-year-old male in Suzhou Zoo, Jiangsu, are the last hope, following the death of a third individual in a Suzhou Buddhist temple in August, the failure of experts to confirm the existence of another animal there, and a dispute over the identity of an animal in Hanoi, Vietnam. Artificial insemination of the surviving animals will be attempted in spring 2008.

Source: *New York Times* 5 December 2007.

Vast scale of pangolin smuggling

Two men in Xiamen, Fujian have been given suspended death sentences, and other gang members life sentences, for smuggling pangolins and other animals into China. From October 2005 to April 2006 the gang smuggled 17 containers of pangolin meat and scales; one container confiscated in summer 2006 contained over 2,800 frozen pangolins.

Source: <http://uk.reuters.com/article/environmentNews/idUKPEK19856420080110>

Rubber erasing Xishuangbanna's biodiverse forests

Based on Landsat images from 1976, 1988 and 2003, forest cover in Xishuangbanna declined from 70% to less than 50%, due mainly to expansion of rubber plantations. Some 1400 km² of tropical seasonal rain forest was lost. Expanding rubber plantations below 800 m also indirectly caused loss of mountain rain forest and subtropical evergreen broadleaf forest higher up, as agricultural activities moved uphill. Scientists consider a balance between economic, social and conservation needs is possible; below 800 m this would mean no new rubber plantations, protection of forest fragments, and reconnection of these by restoring riparian forests. Future rubber plantations should be confined to abandoned arable or shrubland at higher elevations, and tea and other understorey crops should be planted to improve economic returns and reduce erosion.

Source: Li HM, TM Aide, Ma YX *et al.*, 2007. *Biodiversity and Conservation* 16: 1731–1745.

Recent changes in bird taxonomy

A review of recent changes in Asian bird taxonomy includes some changes relating to species in South China.¹ Eastern Great Tit *Parus minor*, with greyish belly, is now considered distinct from the yellow-bellied Northern Great Tit *P. major*,² and is more of a woodland species than the latter which thrives in anthropogenic habitats. White-crowned Penduline Tit *Remiz coronatus* is now thought to include the China population formerly placed in *R. consobrinus*.² Sunda Bush Warbler *Cettia vulcania* now encompasses populations in north Indochina and southern China formerly placed in Aberrant Bush Warbler *C. flavolivacea*.³ *Cettia flavolivacea* is now confined to the Himalayas, southwest China, northeast India and western Myanmar.

Sources: ¹Collar NJ and JD Pilgrim, 2007. *Birding Asia* 8: 14–30. ²Eck S and J Martens, 2006. *Zool. Med. Leiden* 80–5 (1): 1–63. ³Olson U *et al.*, 2006. *Molec. Phylogen. Evol.* 41: 556–565.

“Chinese Barbet” confirmed from molecular data

Molecular data and plumage characteristics suggest the revision of traditional Black-browed Barbet *Megalaima oorti* into four monophyletic species,¹ as suggested independently from morphological data.² *M. oorti* (in Malay Peninsula and Sumatra) and *M. annamensis* (Vietnam) belong to a clade that also contains Blue-throated Barbet *M. asiatica*. A second clade, which diverged from these millions of years ago, contains *M. nuchalis* (Taiwan) – which has been called Taiwan Barbet² – and *M. faber* (Hainan and mainland China) – called Chinese Barbet.² Both these are endemic to the southern China region, although *M. faber* should also occur in northern



中华拟啄木
China Barbet
Megalaime faber

按分子资料对黑眉拟啄木进行分类

如同之前的形态学数据分析结果²，分子资料及羽毛特征亦显示传统的黑眉拟啄木包含四个物种¹。*Megalaime oorti*（分布于马来半岛及苏门答腊）及*M. annamensis*（分布于越南）与蓝喉拟啄木*M. asiatica*为第一分支，而第二分支约在百万年前分化出来，包括*M. nuchalis*（分布于台湾的台湾拟啄木²）及*M. faber*（分布于海南及中国的中华拟啄木²）。第二分支的两种鸟类均是华南特有种，虽然*M. faber*也应分布在越南北部。嘉道理农场暨植物园的研究人员曾在广西西南部的十万大山、龙山、底定、弄信、弄化及大王岭的边境地区记录过这种鸟。

资料来源：¹Feinstein J, Yang X and Li SH, 2008. *Ibis* 150: 40-49. ²Collar NJ, 2006. *Forktail* 22: 170-173. ³KFBG 2002-2003, South China Forest Biodiversity Report Series nos. 10 (ISBN 962-86187-9-2), 26 (ISBN 962-86942-1-9), 28 (ISBN 962-86942-3-5), 35 (ISBN 962-86942-0-0), 36 (ISBN 988-97201-1-6).

于鹦哥岭发现一树栖蚤蜥新属

在海南发现一个树栖蚤蜥新属（直翅目：蚤蜥科）：半隆露蚤蜥属*Semicarinata*及其模式种彩色半隆露蚤蜥*S. colora* Liu & Kang是以在现址为海南鹦哥岭自然保护区采集的两只雄虫为描述依据。蚤蜥科现时全世界约有340个属。

资料来源：Liu CX and Kang L, 2007. *Zootaxa* 1624: 17-29.

还有…来自海南的一个蜘蛛新属

本园于2005年资助了一项对洞穴蜘蛛的调查，随后根据采集的标本发表了一个属于Ochyroceratidae科的新属*Flexicrurum*。模式种是产自五指山的*F. flexicrurum*，此外，这个新属还包括了毛感的*F. longispina*和霸王岭的*F. minutum*。另外五个Ochyroceratidae科的新种都是在不同地区采集，包括霸王岭、五指山、大田及未受保护的东方、昌江及三亚。

资料来源：Tong YF and Li SQ, 2007. *The Raffles Bulletin of Zoology* 55 (1): 63-76.

华南龟类属名改动

根据一个详细的龟类分类检讨结果¹，一些华南龟类在属级上有所变更。拟水龟属*Mauremys*已扩大为一单系群，包含黑颈乌龟*M. nigricans*和乌龟*M. reevesii*（前身属于乌龟属*Chinemys*）及*M. sinensis*²（以往隶于花龟属*Ocadia*）。而本为并系群的棱背龟属*Kachuga*，属内的相关物种（包括*P. tecta*）亦已纳入小棱背龟属*Pangshura*这个单系群属。

资料来源：¹Turtle Taxonomy Working Group, 2007. *Chelonian Research Monographs* 4: 73-84. ²Turtle Taxonomy Working Group, 2007. *Chelonian Research Monographs* 4: 173-199.

2007 红色名录的修订

去年有数个华南物种的全球状况出现变化¹。靛冠噪鵙*Garrulax courtoisi*从黄喉噪鵙*G. galbanus*的亚种被提升为独立种，因其在江西的个体数少于200只，评级由低危转为极危（CR C2a (ii)）。产自广东、广西、云南及越南的罗汉松科的长叶竹柏*Nageia fleuryi*，分布范围虽广，数目却被怀疑不住下降，因而被评为近危（前为资料不详 DD）。艾氏拟水龟*Mauremys iversoni*、菲氏花龟*Ocadia philippeni*、拟眼斑水龟*Sacalia pseudocellata*被视为无效种（杂交种），已从名录中移除。

资料来源：¹IUCN, 2007. *2007 IUCN Red List of Threatened Species*. www.iucnredlist.org. Downloaded on 30 November 2007; ²Collar NJ, 2006. A partial revision of the Asian babbler (Timaliidae). *Forktail* 22: 85-112. ³Turtle Taxonomy Working Group, 2007. *Chelonian Research Monographs* 4: 173-199.

碳排放将如何解决？

加拿大国际开发署及中国科学院资助了一系列的研究，通过量化中国的碳平衡的资料，为提高碳封存能力¹提供资讯与工具。*Journal of Environmental Management* 特刊（第85期）汇报碳回圈遥感模型的资料、森林与土地管理、透过森林管理综合评估碳封存对社会经济影响。1980年代开始采集的7,000个土壤剖面，经数码分析后得出中国土壤含有的有机碳总量，相当于890亿吨，平均密度为每公顷96 t C。（这是与另一近日估值1480 亿立方吨作比较）当中有260亿吨是贮于灌木丛生态系统，而另外有220亿克则藏于森林生态系统之中。这些资料是未来区域变化的国家本底资料。

陆地生态系统碳收支模型 / 森林生态系统碳动态模型尝试估算中国森林在1901至2001年间每年的碳平衡资料，发现中国森林在1901-1949年间的属性已经是碳源（每年的碳排放量为2100万吨），碳排放量继而增至1950-1987的1亿2200万吨，而在1988-2001年间，因种植人工林、森林再生、气候暖化及大气中的二氧化碳施肥效应及氮沉降而转变为碳汇，碳存量为1亿7700万吨，整体来说，二十世纪期间，中国的净碳排放量为33亿吨，每年约为3300万吨。

资料来源：¹Chen JM, SC Thomas, Yin Y et al., 2007. *Journal of Environmental Management* 85: 515-523. ²Yu DS, Shi XZ, Wang HJ et al., 2007. *Journal of Environmental Management* 85: 680-689. ³Li ZP et al., 2007. *Geoderma* 138: 119-126. ⁴Wang S, Chen JM, Ju WM, Feng X, Chen M, Chen P, Yu G, 2007. *Journal of Environmental Management* 85: 524-537.

Vietnam; it was recorded (as *M. oorti*) by KFBG on border areas of Shiwandashan, Longshan, Diding, Nongxin, Nonghua and Dawangling, southwest Guangxi.³

Sources: ¹Feinstein J, Yang X and Li SH, 2008. *Ibis* 150: 40–49. ²Collar NJ, 2006. *Forktail* 22: 170–173. ³KFBG 2002–2003, South China Forest Biodiversity Report Series nos. 10 (ISBN 962-86187-9-2), 26 (ISBN 962-86942-1-9), 28 (ISBN 962-86942-3-5), 35 (ISBN 962-86942-0-0), 36 (ISBN 988-97201-1-6).

Yinggeling yields a new genus of bush-cricket

A new genus of bush-cricket (Orthoptera: Tettigoniidae) has been described from Hainan. The genus *Semicarinata* and its type species *S. colora* Liu & Kang, 2007 is described from two males collected from Yinggeling Nature Reserve, Hainan. There are some 340 tettigoniid genera worldwide.

Source: Liu CX and Kang L, 2007. *Zootaxa* 1624: 17–29.

...And a new spider genus from Hainan

Cave spiders collected during a KFBG-funded 2005 survey in Hainan turn out to belong to a genus of Ochyroceratidae, *Flexicrurum*, new to science. The type species *F. flexicrurum* was found at Wuzhishan; *F. longispina* from Maogan, and *F. minutum* from Bawangling. Five other new ochyroceratid species were found from various localities including Bawangling, Wuzhishan and Datian and unprotected sites in Dongfang, Changjiang and Sanya.

Source: Tong YF and Li SQ, 2007. *The Raffles Bulletin of Zoology* 55(1): 63–76.

Changes in turtle nomenclature

Several South China turtles have been transferred to different genera following a comprehensive taxonomic review.¹ The genus *Mauremys* has been expanded to make it a monophyletic group, now including *M. nigricans* and *M. reevesii* (both formerly in *Chinemys*) and *M.* (formerly *Ocadia*) *sinensis*.² *Kachuga* was also previously paraphyletic, and to resolve this several species have been transferred to the monophyletic genus *Pangshura* including *P. tecta*.

Sources: ¹Turtle Taxonomy Working Group, 2007. *Chelonian Research Monographs* 4: 73–84. ²Turtle Taxonomy Working Group, 2007. *Chelonian Research Monographs* 4: 173–199.

Changes in Red List status, 2007

Few South China species changed their global status during 2007.¹ Blue-crowned Laughingthrush *Garrulax courtoisi*, now considered distinct from the “Least Concern” species *G. galbanus*², is Critically Endangered (CR C2a(ii)) due to its tiny population (<200) in Jiangxi. The podocarp tree *Nageia fleuryi*, native to Guangdong, Guangxi, Yunnan and Vietnam, is now considered Near Threatened (previously Data Deficient) due to new information on its wide range and suspected decline. Several turtles (*Mauremys iversoni*, *Ocadia philippeni*, *Sacalia pseudocellata*) have been removed from the Red List as they were found to be invalid taxa (hybrids).³

Sources: ¹IUCN, 2007. *2007 IUCN Red List of Threatened Species*. www.iucnredlist.org. Downloaded on 30 November 2007; ²Collar NJ, 2006. A partial revision of the Asian babblers (Timaliidae). *Forktail* 22: 85–112. ³Turtle Taxonomy Working Group, 2007. *Chelonian Research Monographs* 4: 173–199.

Where will all the carbon go?

A series of studies have been conducted, funded by the Canadian International Development Agency and China Academy of Sciences, to quantify China's carbon balance, and provide the information and tools to support enhanced carbon sequestration.¹ A special issue of the *Journal of Environmental Management* (vol. 85) reports findings on remote sensing and carbon modeling, forest and soil assessment, and integrated assessment of the socioeconomic implications of carbon sequestration via forest management. China's total stock of soil organic carbon is revealed, by digital analysis of over 7,000 soil profiles from the 1980s, to be 89 Pg (=89 billion tonnes), with mean density 96 t C per ha.² (This compares with another recent estimate of 148 Pg.³) Of this 26 Pg is stored in shrub ecosystems and 22 Pg in forest ecosystems. The data provide a national baseline for future regional changes.

The Integrated Terrestrial Ecosystem C-budget model (InTEC) estimates annual carbon balance of China's forests from 1901 to 2001, finding them to be a carbon source (21 Tg C, or 21 million tonnes, per yr) from 1901 to 1949, increasing to 122 during 1950–1987, then switching to become a sink of 177 during 1988–2001 due to plantation, forest regrowth, climate warming, atmospheric CO₂ fertilization and nitrogen deposition.⁴ Overall they were a net source of 3.3 PgC during the 20th Century, about 33 TgC per yr.

Sources: ¹Chen JM, SC Thomas, Yin Y *et al.*, 2007. *Journal of Environmental Management* 85: 515–523. ²Yu DS, Shi XZ, Wang HJ *et al.*, 2007. *Journal of Environmental Management* 85: 680–689. ³Li ZP *et al.*, 2007. *Geoderma* 138: 119–126. ⁴Wang S, Chen JM, Ju WM, Feng X, Chen M, Chen P, Yu G, 2007. *Journal of Environmental Management* 85: 524–537.



黑颈乌龟
Mauremys nigricans

- Ananjeva NB, NL Orlov and Nguyen Quang Truong, 2007. Agamid lizards (Agamidae, Acrodonta, Sauria, Reptilia) of Vietnam. *Mittheilungen aus der zoologische Sammlung des Museums für Naturkunde in Berlin Reihe 83 Supplement*: 13-21.
A review of Vietnamese agamids notes nine species recorded in the three provinces adjoining South China (Guangxi). Of these all are known from South China except *Japalura chapaensis* and *Calotes mystaceus* — the latter has been recorded from Yunnan but not Guangxi.
该项研究指在越南接壤华南(广西)的三个省份,共记录到9种鬣蜥科蜥蜴。当中除了*Japalura chapaensis*和白唇树蜥*Calotes mystaceus*外,其余7种在华南地区亦有分布,而白唇树蜥则分布在云南省。
- Calder IR, 2007. Forests and water — ensuring forest benefits outweigh water costs. *Forest Ecology and Management* 251: 110-120.
- Clement F and JM Amezcaga, 2008. Linking reforestation policies with land use change in northern Vietnam: Why local factors matter. *Geoforum* 39: 265-277.
- Gao LM, Moller M, Zhang XM, Hollingsworth ML, LIU J, Mill RR, Gibby M and Li DZ, 2007. High variation and strong phylogeographic pattern among cpDNA haplotypes in *Taxus wallichiana* (Taxaceae) in China and North Vietnam. *Molecular Ecology* 16: 4684-4698.
- Gu K and Wall G, 2007. Rapid urbanization in a transitional economy in China: the case of Hainan Island. *Singapore Journal of Tropical Geography* 28 (2): 158-170.
Argues for establishing a practical framework that combines socioeconomic planning, land use planning, and the management of both, to achieve sustainable growth.
主张需要确立一个集社会经济规划、土地利用及管理两者的可行框架,来实现持续增长。
- Gu YS, DM Pearsall, Xie SC and Yu JX, 2008. Vegetation and fire history of a Chinese site in southern tropical Xishuangbanna derived from phytolith and charcoal records from Holocene sediments. *Journal of Biogeography* 35: 325-341.
A study of phytoliths (plant opal silica bodies) from the past 2000 years detects the influence of drought events on fire in the tropical rainforest at Xishuangbanna, south Yunnan. Ecological dynamics of the forest are found to be strongly influenced by drought and fire, coupled in recent centuries by human activity. Expected vegetation changes under global warming and increased human activity are discussed.
研究云南南部西双版纳过去2000年来的植硅体,侦测过往因旱灾引发的山火,对当地热带雨林的影响。研究发现当地森林生态的动态,因旱灾、山火和最近数百年人类活动遭受非常深远的影响。此外,亦有探讨全球暖化及人类活动增加对植被带来的预期变化。
- Hu XF, Chen FS, Hu AF and Dai LM, 2007. Sustainability assessment for Yanbian forest region, Jilin Province, Northeast China, based on ecological footprint model. *Frontiers of Forestry in China* 2 (4): 390-395.
- Huang J, Xu Q, Sun ZJ, Gui LT and Zi YS, 2007. Identifying earthworms through DNA barcodes. *Pedobiologia* 51: 301-309.
The value of DNA barcoding to help overcome the taxonomic impediment is tested on China's earthworms. Sequence diversity in a mitochondrial gene successfully discriminates 28 species: sequence divergence within species was generally <1%, while that between species was >15%. The tool is found to be a powerful complement to traditional taxonomy.
尝试以中国蚯蚓为测试DNA条码对解决分类学问题的重要性。一个线粒体基因的序列多样性可以成功将28个物种分辨:物种内的序列多样性差异一般少于1%,而物种间的差异却大于15%。这个可说是能补足传统分类学的有效方法。
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A book of 28 papers selected from a WCPA conference in June 2005 in Hong Kong. Includes papers on protected-areas establishment, evaluation and management, ecology and conservation, recreation and tourism.
全书辑录了28篇于世界保护区委员会大会发表的论文,题材包括保护区成立、评估与管理、生态及保育和休憩及旅游。
- Kaimowitz D and Sheil D, 2007. Conserving what and for whom? Why conservation should help meet basic human needs in the tropics. *Biotropica* 39 (5): 567-574.
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柯海丽、宋希强、谭志琼、刘红霞、罗毅波, 2007. 野生五唇兰根部内生真菌多样性研究. *生物多样性* 15 (5): 456-462。
- Kendrick RC, 2007. The conservation assessment of moths in Hong Kong. Pp. 71-82 in Kendrick RC (ed.), *Proceedings of the First Southeast Asian Lepidoptera Symposium, Hong Kong 2006*. Kadoorie Farm & Botanic Garden, Hong Kong.
- Kiu KY, Loi CY and Kendrick RK, 2007. A decade of butterfly gardening at Kadoorie Farm & Botanic Garden: raising conservation awareness through education. Pp. 117-123 in Kendrick RC (ed.), *Proceedings of the First Southeast Asian Lepidoptera Symposium, Hong Kong 2006*. Kadoorie Farm & Botanic Garden, Hong Kong.
The progress of KFBG's Butterfly Garden is reviewed, following its establishment in 1995 on the sloping Hong Kong hillside garden using food plants to attract wild butterflies (and people). A 2005 visitor survey found the site the most popular in the upper KFBG area. Since 2001 the Butterfly Garden has reduced the abundance of the exotic nectar-plant *Lantana camara* in favour of native species with flowering periods spread throughout the year. It has also diversified the food plants and made modifications for lower maintenance (more perennials, native plants needing less watering, and fencing against wild animal damage). The site offers a model education facility suitable for semi-natural areas in the region.
回顾嘉道理农场暨植物园蝴蝶园在过去十年的发展,蝴蝶园于1995年建立,位于本园的山坡上,种植了食料植物吸引野外蝴蝶(及吸引游客赏蝶)。2005年的游客调查发现蝴蝶园是本园上山区最受游客欢迎的地区。自2001年,已减少种植外来蜜源植物马缨丹,并以全年开花的原生植物取而代之。此外,食料植物亦更趋多元化,而为减轻日常保养工作的措施亦相应推行(包括种植多些多年生植物、种植原生植物以减少浇水及加设围栏以防野生动物入侵造成破坏)。它亦成了本园其他半天然地区的教育设施示范点。
- Koh LP, 2007. Impacts of land use change on South-east Asian forest butterflies: a review. *Journal of Applied Ecology* 44: 703-713.
- Lee KS, Chan BPL, Lu G and Su WB, 2007. Wetland birds of Hainan Island, China: results from winter waterbird surveys 2003-2007. *Forktail* 23: 92-101.
- Lee WH and GKL Chow, 2007. An update on the population control of House Crow *Corvus splendens* in Hong Kong. *Hong Kong Biodiversity* 15: 11-15. www.afcd.gov.hk/english/conservation/hkbiodiversity/newsletters/files/IssueNo15.pdf
- Lei FM, Wei GA, Zhao HF, Yin ZH and Lu JL, 2007. China subregional avian endemism and biodiversity conservation. *Biodiversity and Conservation* 16 (4): 1119-1130.
- Li BC, Jiang PP and Ding P, 2007. First breeding observations and a new locality record of White-eared Night-heron *Gorsachius magnificus* in Southeast China. *Waterbirds* 30 (2): 301-304.
- Li SM, J Saborowski, J Nieschulze, Li ZY, Lu YC and Chen EX, 2007. Web service based spatial forest information system using an open source software approach. *Journal of Forestry Research* 18 (2): 85-90.
- Lindenmayer D *et al.*, 2008. A checklist for ecological management of landscapes for conservation. *Ecology Letters* 11 (1): 78-91. doi: 10.1111/j.1461-0248.2007.01114.x
- Lou C, Liu AX and Zhu GM, 2008. Management pattern of ecological public welfare forests in South China. *Frontiers of Forestry in China* 3 (1): 58-63.
- Ma CL, RK Moseley, Chen WY and Zhou ZK, 2007. Plant diversity and priority conservation areas of northwestern Yunnan, China. *Biodiversity and Conservation* 16: 757-774. doi 10.1007/s10531-005-6199-6
Under the Yunnan Great Rivers Project, important areas for plant conservation were identified through expert workshops, focusing on the distribution of 98 endangered species and 703

species endemic to the Hengduan Mountains. The vegetation types richest in these target species included Alpine Meadow and Evergreen Broadleaf Forest, with the latter especially rich relative to its size. Experts identified nine Plant Diversity Conservation Areas, covering 17% of the YGRP area, for urgent attention.

云南河川保育计划就98个濒危种及703个横断山脉特有的分布召开专家研讨会，确认出植物保育的重要地区。这些地区中最丰富的植被类型包括高山草甸和常绿阔叶林，以后者的相对面积而言是异常丰富。专家划出九个极需关注的植物多样性保育区域，占计划实施地区的总面积的17%。

- Melick D, Yang XF and Xu JC, 2007. Simplification of pine forests due to utilization by Tibetan villages in Southwest China. *Environmental Management* 40: 866-879. doi 10.1007/s00267-007-9015-0

Studies of northwest Yunnan *Pinus densata* forests under different levels of wood and timber extraction showed that moderate extraction reduced the understorey and cryptogamic (non-seed-plant) flora, but allowed retention of good habitats for non-timber forest products. High extraction transformed forests into open, herb-rich habitats with degraded NTFP habitats. Understorey development, litter cover and cryptogamic richness could be used as indicators of the sustainability of forest utilisation.

云南西北部高山松林面对不同程度的木材采伐，研究结果显示，中度采伐虽令林下及隐花植物减少，却可为非木材林产品保留完好的生境。采伐过于频繁会使森林变成开阔、草本丰富的生境，其非木材林产品亦会退化。林下植物的生长、枯枝落叶层及隐花植物的丰富度都可作为森林是否得以持续利用的指标。

- Melick D, Yang XF and Xu JC, 2007. Seeing the wood for the trees: how conservation policies can place greater pressure on village forests in southwest China. *Biodiversity and Conservation* 16: 1959-1971. doi 10.1007/s10531-006-9115-9

A case study from northwest Yunnan finds local negative impacts of blanket national conservation policies, combined with new road access and bamboo decline. Wood demands are fast exceeding sustainable harvest levels, leading to loss of timber resources and non-timber forest products habitat, and grazing pressure is degrading pastures and forests. The authors call for more flexible forest policy taking into account local needs.

一个于云南西北部进行的个案研究，发现当地一刀切的国家保育政策，加上新建公路以及竹林资源下降为当地造成负面影响。木材需求远超过可持续砍伐的水平，以致损失木材资源及非木材林产品生境，而放牧的沉重压力亦使草原及森林退化。作者盼能设计一些、更具灵活性的森林政策，以符合当地需要。

- Men XY, Guo XG, Dong WG and Qian TJ, 2007. Population dynamics of *Dremomys pernyi* and *Callosciurus erythraeus* in protective and non-protective pine forests at different ages. *Frontiers of Biology in China* 2 (2): 242-246.

Studies in pine plantations of Yunnan's Cangshan Erhai NNR showed colonisation within ten years by *Perny's* Long-nosed Squirrel *D. pernyi* and within 20 years by *Pallas's* Squirrel *C. erythraeus*. Outside the protected area pine plantations showed later colonisation, and squirrel densities were 3-4 times lower in 31-40 year-old stands.

云南苍山和洱海国家自然保护区内的人工松林在植林10年及20年内分别招来长吻松鼠和赤腹松鼠在林内建立种群。然而，保护区以外的人工林却需更长时间才有松鼠建立种群。此外，以31-40年的松林为例，保护区内的松鼠密度较保护区外的高3-4倍。

- Mo JM, S Brown, Xue JH Fang YT, Li ZA, Li DJ and Dong SF 2007. Response of nutrient dynamics of decomposing pine (*Pinus massoniana*) needles to simulated N deposition in a disturbed and a rehabilitated forest in tropical China. *Ecological Research* 22: 649-658.

- Mo JM, Zhang W and Zhu WX, 2007. Response of soil respiration to simulated N deposition in a disturbed and a rehabilitated tropical forest in southern China. *Plant Soil* 296: 125-135.

- Oi YL and Dudgeon D, 2007. Shredders: abundance, species richness, and role in litter breakdown in Hong Kong streams. *North American Benthological Society, 55th Annual Meeting*, <http://nabs.confex.com/nabs/2007/techprogram/P1341.htm>

- Ou ZY, Yang XB and Wu QS, 2007. Species diversity of natural forests in the enlarged area of Jianfengling National Nature Reserve, Hainan Island. *Biodiversity Science* 15 (4): 437-444.

欧芷阳、杨小波、吴庆书, 2007。尖峰岭自然保护区扩大区域植物多样性研究。《生物多样性》15 (4): 437-444。

- Pan QH, Wang YX and Yan K, 2007. *A Field Guide to the Mammals of China*. China Forestry Publishing House, 420 pp.

- Qi S, Wang YQ and Wang YJ, 2007. Effects of reforestation on the hydrological function of a small watershed in the Three Gorges Reservoir Area. *Frontiers of Forestry in China* 2 (2): 148-156.

- 土地在沉思：传统文化与农村建设·社区伙伴出版·2007年7月

Partnerships for Community Development (PCD) is a charitable organization in Hong Kong which has run a learning forum for rural villagers and urban dwellers since 2004 to explore the influence of culture on rural community development. In Oct 2005, PCD convened a Conference on cultural reflections and rural development, while the in-depth sharing and deliberations are all covered in this proceedings.

社区伙伴是香港注册的慈善机构，自2004年起尝试建构一个让农村和城市合作伙伴们一起学习和思考的平台，探索文化在农村社区建设的力量。2005年10月社区伙伴在广西南宁召开“文化反思与农村建设研讨会”，会上分享的许多深刻经验和反思都收录在这本书里。

- Research Institute of Forestry Policy and Information (RIFPI), Chinese Academy of Forestry (CAF), 2007. *Trade Flows and Distribution of Tropical Wood Products in China*. Beijing, China. ITTO, Yokohama, Japan.

- Scherr SJ and JA McNeely (eds.), 2007. *Farming with Nature: The Science and Practice of Ecoagriculture*. Island Press, Washington, Covelo and London.

- Sekhar NU, 2007. Traditional versus improved agroforestry systems in Vietnam: A comparison. *Land Degradation & Development* 18: 89-97.

Communities around Babe National Park, north Vietnam, were studied. Traditional agroforestry systems grew 42 species (60% of them native), while "improved" agroforestry selectively grew 19 species of high economic value. Improved systems produced higher income and productivity but lower biodiversity, and were not viable on steep terrain. Growing populations are putting a strain on forest resources, prompting policies to restrict forest access; these restrictions in turn are reducing farmers' willingness to manage natural forests sustainably. New policy should be built on traditional rights and knowledge as well as forest rehabilitation.

研究越南北部巴碧国家公园的森林群落。传统农林系统共种植42种作物(60%为本土物种)，而经“改良”过的农林系统则选择性地种出19种高经济价值的作物。改良后的农业系统不论是收入及生产力都得到提高，然而生物多样性却呈下降，且不适用于山势陡峭的区域。人口不断增加对森林资源造成一定的压力，引致限制进入森林的政策，可是这些限制也会减低农户以可持续方式管理天然林的意欲。新政应把重点放在传统权利与知识及森林恢复之上。

- Shek CT, CSM Chan and Wan YF, 2007. Camera trap survey of Hong Kong terrestrial mammals in 2002-06. *Hong Kong Biodiversity* 15: 1-11. www.afcd.gov.hk/english/conservation/hk Biodiversity/newsletters/files/IssueNo15.pdf

A comprehensive Hong Kong survey of medium to large mammals, using over 65,000 camera-trapping days, took over 10,000 photographs of 17 species. Most commonly photographed were Malayan Porcupine *Hystrix brachyura* (22% of photos), Indian Muntjac *Muntiacus muntjac* (20%), Small Indian Civet *Viverricula indica* (13%) and Wild Boar *Sus scrofa* (11%). Also quite common were Chinese Ferret-badger *Melogale moschata* (7.2%), Masked Palm Civet *Paguma larvata* (5.0%), Leopard Cat *Prionailurus bengalensis* (4.0%), Rhesus Monkey *Macacaulatta* (3.3%) and Javan Mongoose *Herpestes javanicus* (2.2%). Among the most rarely photographed were Greater Bandicoot Rat *Bandicota indica* (0.05%), Eurasian Otter *Lutra lutra* (0.11%), Yellow-bellied Weasel *Mustela kathiah* (0.21%), Chinese Pangolin *Manis pentadactyla* (0.36%) and Crab-eating Mongoose *Herpestes urva* (0.95%). While most wild mammals were predominantly nocturnal, Wild Boar and Javan Mongoose were largely diurnal, Rhesus Monkey, Yellow-bellied Weasel and Crab-eating Mongoose strictly so, and Indian Muntjac was cathemeral (active throughout the diel cycle) with an activity peak at dusk.

一项对大中型哺乳类动物的综合调查，红外线照相机总共安放了逾65,000机工作日，拍得过万张相片，当中涉及物种共17个。最常拍摄得到的包括豪猪(占相片的22%)、赤麂(20%)、小灵猫(13%)和野猪(11%)。较普通的有鼬獾

- (7.2%)、果子狸 (5.0%)、豹猫 (4.0%)、獾 (3.3%) 及红颊獾 (2.2%)。当中最罕见的为印度板齿鼠 (0.05%)、水獭 (0.11%)、黄腹鼬 (0.21%)、穿山甲 (0.36%) 和食蟹 (0.95%)。大部分的野生哺乳动物都主要是夜行性的，只有野猪及红颊獾大多在日间活动，而獾、黄腹鼬及食蟹獾更是绝对的昼行动物，赤鹿则昼夜都会出现，当中又以在黄昏时分最活跃。
- Shi J, Luo YQ, Song JY, Yan XS, Jiang P and Wang YJ 2007. Impact of the invasion of pinewood nematode and the following different removal disturbance intensities on the plant diversity of Masson pine community. *Frontiers of Forestry in China* 2(4): 466-473. doi10.1007/s11461-007-0074-4
 - Sikor T and Tran Ngoc Thanh, 2007. Exclusive versus inclusive devolution in forest management: Insights from forest land allocation in Vietnam's Central Highlands. *Land Use Policy* 24: 644-653.
A case study on exclusive devolution of forest management (i.e. assigning forest ownership rights to local actors who were obliged to exclude others) found it failed to diminish the gap between state and customary regulations, created conflicts among local people, and contributed to forest loss. The findings suggest a need for a more inclusive approach to devolution, accommodating the overlapping claims of multiple actors. Individual users should have proprietary (not ownership) rights, and governance relations should be nested, involving both state and customary actors.
有关越南森林管理的专属转移 (把森林所有权分配给当地参与者) 的个案研究显示这种做法并不能消除国家与习俗法规的隔阂，更会引发当地人出现纠纷，森林面积亦有所损失。资料显示森林所有权的转移应该是包容性的，并须调解不同参与者之间重叠的要求。个别用户亦应只有使用权 (而非拥有权)，并由国家及传统的参与者共同来管理。
 - Su T and Zhang ED, 2007. Ecosystem valuation and the conservation of wild lands in vigorous economic regions: A case study in Jiuduansha Wetland, Shanghai. *Chinese Science Bulletin* 52 (19): 2664-2674. doi 10.1007/s11434-007-0414-7
An assessment of total economic value reveals the need for caution in applying economic valuation of ecosystems, especially in rapidly developing areas such as Shanghai. Since local residents vary in how much they value wilderness, and valuation could change with greater knowledge, the authors urge against irreversible conversion of wetlands to dry land on simple economic grounds.
一项对整体经济价值的评估，揭示在应用生态系统的经济估值时，特别是在如上海等经济发展迅速的地区，须格外小心。因为当地人对荒野的价值观各异，而估值会随着知识的增长而改变，作者强烈反对基于单纯的经济原因，不可逆转地将湿地改变为旱地。
 - Tian HZ and Xing FW, 2008. Elevational diversity patterns of orchids in Nanling National Nature Reserve, northern Guangdong Province. *Biodiversity Science* 16 (1): 75-82.
A KFBG-funded study finds 70 orchid species at Nanling NNR. The altitudinal diversity pattern suggests the limiting influence of temperature and humidity at elevations above 1000 m, with a negative impact of human disturbance below 600 m.
嘉道理农场暨植物园资助的研究于南岭国家级自然保护区发现 70 种兰花。从海拔变化的格局看来，海拔 1,000 米以上的温度和湿度对兰花植物的生长的影响有限，而 600 米以下已出现人为干扰。
 - Trevelyan R, 2007. *Fundraising Guidelines*. Tropical Biology Association, Skills Series. www.tropical-biology.org/admin/documents/pdf_files/Skills_series/Fundraising_FINAL.pdf
 - Trevelyan R, Cook J and Fisher M, 2007. *Scientific Writing & Publishing Results*. Tropical Biology Association, Skills Series. www.tropical-biology.org/admin/documents/pdf_files/Skills_series/Scientific%20Writing_FINAL.pdf
 - Vermeulen S and Sheil D, 2007. Partnerships for tropical conservation. *Oryx* 41 (4): 434-440.
 - Wan BT, Xu HG, Ding H, Liu ZL and Wang J, 2007. Methodology of comprehensive biodiversity assessment. *Biodiversity Science* 15 (1): 97-106.
万本太、徐海根、丁辉、刘志磊、王捷, 2007。生物多样性综合评价方法研究。《生物多样性》15 (1): 97-106。
 - Wang BS, Peng SL, Guo L and Ye YH, 2007. Diversity of tropical forest landscape types in Hainan Island, China. *Acta Ecologica Sinica* 27 (5): 1690-1695.
王伯荪、彭少麟、郭涓、叶有华, 2007。海南岛热带森林景观类型多样性。《生态学报》27 (5): 1690-1695。
 - Wang BY, Luo FH, Zhen XN and Yu SX, 2007. Grey forecasting of forest biodiversity dynamics in China. *Biodiversity Science* 15 (4): 393-399.
王本洋、罗富和、甄学宁、徐世孝, 2007。中国森林生物多样性动态的灰色预测。《生物多样性》15 (4): 393-399。
 - Wang FX, Wang ZY and J Lee HW, 2007. Acceleration of vegetation succession on eroded land by reforestation in a subtropical zone. *Ecological Engineering* 31: 232-241.
Studies on denuded plots in Huiyang and Longchuan, east-central Guangdong, found differences between planted plots and those left to recover naturally. The latter showed higher initial plant diversity, but formed a poorly developed shrub-herb community after 26 years, with just 35% vegetation cover; here secondary forest growth was expected to require about 60 years. In a Shangyang (Huiyang) plot planted with *Acacia auriculiformis*, vegetation cover reached 90% after 12 years, controlling erosion; within 23 years there was a complex understorey community of native species. Here forest was expected to grow within 30 years, accelerated by strategies such as terracing and manuring.
针对广东中东部的惠阳及龙川的裸地的研究，发现植林地与自然恢复的裸地的不同之处。自然恢复的裸地内最初时植物多样性较高，但在 26 年后会演变成发展不良的灌木及草本群落，植被覆盖率仅达 35%，次生林生长预期需要约 60 年的时间。惠阳上阳镇的植林地上则种植了大叶相思，12 年后的植被覆盖率可达 90%，并能有效抑制水土流失，23 年内将有一个由本土物种组成的复杂林下群落，通过如建立阶地及施肥的配合，有望当地在 30 年内可发展为森林。
 - Wang J, Ma QY, Du F and Yang YM, 2007. Altitudinal patterns of the flora of seed plants in Dawei Mountain in Yunnan Province, Southwest China. *Frontiers of Forestry in China* 2 (1): 40-46 [duplicated in *Forestry Studies in China* 9 (3): 169-176].
The tropical rainforest at Daweishan NNR in southeast Yunnan was found to extend to 1,500 m, with humid rainforests below 700 m and mountain rainforests at 700-1,500 m. Monsoon evergreen broadleaf forest occurred at 1,300-1,800 m and mountain mossy evergreen broadleaf above 1,800 m.
云南东南部的大围山国家级自然保护区的热带雨林伸展至海拔 1,500 米，700 米以下为潮湿雨林，而 700-1,500 米则为山地雨林。1,300-1,800 米为季风常绿阔叶林，而 1,800 米以上为山地苔藓常绿阔叶林。
 - Wang QK and Wang SL, 2007. Soil organic matter under different forest types in Southern China. *Geoderma* 142: 349-356.
Studies of native broadleaf forest and *Cunninghamia lanceolata* monoculture in San Menjiang Forest, Guangxi, found the monoculture to have far lower organic carbon, nitrogen and microbial biomass than the broadleaf forest. Hot-water extractable organic matter was found to be an indicator of changes in the quality of forest soil organic matter.
广西三门江森林的本土阔叶林及单一种植杉林的研究发现，单一种植产生的有机碳、氮及微生物量远少于阔叶林。热水溶性有机物质更是森林土壤有机物质改变的指标。
 - Wang QK, Wang SL, Bing F and Yu XJ, 2007. Litter production, leaf litter decomposition and nutrient return in *Cunninghamia lanceolata* plantations in south China: effect of planting conifers with broadleaved species. *Plant Soil* 297: 201-211.
A study in Huitong, Hunan, finds nutrient return to soil higher in mixed *Cunninghamia*-broadleaf plantations than in *Cunninghamia* monocultures, with implications for restoring degraded sites.
湖南会同县的研究发现杉木阔叶混交林比单一种植杉林有较高的养分回归土壤，对恢复退化地区具有借鉴意义。
 - Wang S, Liu C and Wilson B, 2007. Is China in a later stage of a U-shaped forest resource curve? A re-examination of empirical evidence. *Forest Policy and Economics* 10: 1-6. doi 10.1016/j.forpol.2006.12.003
A previous claim was made that China has entered a later stage of a Kuznets U-shaped forest resource curve, which assumes that an economic wellbeing index (in this case Gross Domestic Product) is associated with first declining environmental quality, then recovery. Taking forest cover as the measure of resource quality, an analysis of published data reveals that, on the contrary, as income levels increase in a province, the increase in forest cover slows down.
早前有专家声称中国的森林资源已进入库兹涅茨 U 型曲线的晚期，即经济健康指数 (这里以国内生产总值) 是与先下降

然 后恢复的环境素质挂钩。作者就已发表的资料进行分析, 利用森林覆盖作为量度资源素质的指标, 结果证明, 跟上述的假设相反, 当一个省的收入增加其森林覆盖增长的速度则减慢。

- Wang WJ, Zhang M, Liu FD, Zheng JW, Wang ZS, Zhang ST, Yang WJ and An SQ. 2007. Species association in tropical montane rain forest at two successional stages in Diaolu Mountain of Hainan Island. *Biodiversity Science* 15 (3): 257-263.

王文进、张明、刘福德、郑建伟、王中生、张世挺、杨文杰、安树青, 2007. 海南岛吊罗山热带山地雨林两个演替阶段的种间联结性。《生物多样性》15 (3): 257-263.

- Wang XH, M Kent and Fang XF, 2007. Evergreen broad-leaved forest in Eastern China: Its ecology and conservation and the importance of resprouting in forest restoration. *Forest Ecology and Management* 245: 76-87.

- Wang YH, Solberg S, Yu PT, Myking T, Vogt RD and Du SC, 2007. Assessments of tree crown condition of two Masson pine forests in the acid rain region in south China. *Forest Ecology and Management* 242: 530-540.

- Wang ZH, Yang CB, Yang LM, Zhou ZZ, Rao J, Yuan L and Li J., 2007. Relationship and its ecological significance between plant species diversity and ecosystem function of soil conservation in semi-humid evergreen forests, Yunnan Province, China. *Frontiers of Forestry in China* 2 (1): 18-27.

Studies in five forest communities found a strong negative correlation between plant species diversity and surface runoff, soil erosion and total loss of phosphorus. Values of these factors in the lowest-diversity plots were respectively 12x, 50x and 25x higher than those in the highest-diversity plots.

五个森林群落的研究发现植物物种多样性与径流、水土流失及磷的总体流失等成非常强烈的负面关系。在生物多样性最低的样地上, 其数值分别以12倍、50倍及25倍高于生物多样性最高的样地。

- Wong EYH, Sze PWC and Wong AKC, 2007. Territory wide butterfly monitoring programme in Hong Kong. Pp. 83-90 in Kendrick RC (ed.), *Proceedings of the First Southeast Asian Lepidoptera Symposium, Hong Kong 2006*. Kadoorie Farm & Botanic Garden, Hong Kong.

- Wu ZY, Sun H, Zhou ZK, Peng H and Li DZ, 2007. Origin and differentiation of endemism in the flora of China. *Frontiers of Biology in China* 2 (2): 125-143.

The 239 seed plant genera endemic to China are reviewed. Endemic gymnosperms date back to the Palaeozoic (>250 m years ago). Widely distributed in the Tertiary (65-2.4 mya), many groups died out due to climate changes in the Quaternary (last 2.4 my), with main refuges in North America and East Asia, where Central and East China became particular core areas. Younger endemic genera arose from these. Hainan-endemic genera include *Chieaiodendron* (Annonaceae), *Pentastelma* (Asclepiadaceae), *Cathayanthus* and *Metapetrocosmea* (Gesneriaceae), *Setiacia* (Gramineae), *Chunia* (Hamamelidaceae) and *Wenchengia* (Labiatae). Other South China endemics include *Corsiopsis* (Corsiaceae), *Chiritopsis*, *Didymostigma*, *Metabriggsia* and *Primulina* (Gesneriaceae), *Oligostachyum* (Gramineae), *Semiliquidambar* (Hamamelidaceae), *Stapfiophyton* and *Tigridiopalm* (Melastomataceae), *Nothotsuga* (Pinaceae), *Terniopsis* (Podostemaceae), *Tsiangia* (Rubiaceae), *Apteroperma*, *Euryodendron* and *Tutcheria* (Theaceae).

分析研究了239个种子植物中国特有属。特有裸子植物的出现可追溯到古生代(二亿五千万年前或更早)。不少植物类群于第三纪(6,500-240万年前)都有广阔分布区, 可是因气候变化已于第四纪(240万年前)灭绝, 幸存的物种大多分布在北美及东亚地区, 而华东及华中更成了这些物种的核心区。较新的特有属也由此些幸存者而起。海南特有属包括 *Chieaiodendron* (番荔枝科)、*Pentastelma* (萝藦科)、扁蒴苣苔属和盾叶苣苔属(苦苣苔科)、*Setiacia* (禾本科)、*Chunia* (金缕梅科)和百里香属(唇形科)。其他华南特有属包括 *Corsiopsis* (白玉簪科)、小花苣苔属、双片苣苔属、单座苣苔属及报春苣苔属(苦苣苔科)、少穗竹属(禾本科)、半枫荷属(金缕梅科)、无距花属及虎颜花属(野牡丹科)、长苞铁杉属(松科)、川藻属(川蔓草科)、蒋英木属(茜草科)、圆籽荷属、猪血木属和石笔木属(茶科)。

- Xiang XG, Cao M and Zho ZK, 2007. Fossil history and modern distribution of the genus *Abies* (Pinaceae). *Frontiers of Forestry in China* 2 (4): 355-365.

- Yan ER, Wang XH, Huang JJ, Zeng FR and Gong L, 2007. Long-lasting legacy of forest succession and forest management: Characteristics of coarse woody debris in an evergreen broad-leaved forest of Eastern China. *Forest Ecology and Management* 252: 98-107.

A study in Tiantong National Forest Park, Zhejiang, found coarse woody debris volume and mass to be moderate in early- succession forest, lower in middle-succession forest, and highest in late-succession forest, which had more logs and stumps. Debris distribution was affected by human and natural disturbances.

研究浙江天童国家森林公园中粗木质残体在森林不同演替时期的覆盖量的多寡, 早期演替森林居中、中期演替森林较少、并以后期演替森林堆积得最多, 那里发现的枯树干和木桩亦较多。木质残体的分布取决于人类及天然干扰。

- Yang Y, Zhang YX and Dudgeon D, 2007. The effects of a herbivorous fish *Pseudogastromyzon myersi* (Balitoridae) on benthic algae in Hong Kong streams. *North American Benthological Society, 55th Annual Meeting*, <http://nabs.confex.com/nabs/2007/techprogram/P1342.htm>

Finds the loach *P. myersi* has a measurable impact on benthic algal biomass in unshaded streams.

发现麦氏拟腹吸鳅对开阔溪流的底栖水藻生物量有一定的影响。

- Zhang J and Gan JB, 2007. Who will meet China's import demand for forest products? *World Development* 35 (12): 2150-2160.

- Zang RG, Zhang WY and Ding Y, 2007. Seed dynamics in relation to gaps in a tropical montane rainforest of Hainan Island, South China: (1) seed rain. *Journal of Integrative Plant Biology* 49 (11): 1565-1572.

A study in forest at Bawangling NNR, at about 1,050 m asl, finds a peak in seed rain (seeds falling on the ground) in September to December, at the end of the wet season. Seed rain was lower in the centre of canopy gaps (~15 per m² per month) than in closed stands (~29), except in very windy months. Bigger gaps did not have significantly lower seed rain.

对霸王岭国家级自然保护区海拔1,050米以上的森林的种子雨(指种子掉落地面)进行研究, 发现种子雨的高峰主要在雨季之后, 即九月至十二月出现。除了在刮猛风的月分外, 树冠层空隙中心的种子雨(每月每平方米约15颗)会比郁闭林分(约29颗)少。然而较大的树冠层空隙, 种子雨也不会明显减少。

- Zhang J, Gu Y, Chang J, Jiang B, Jiang H, Peng CH, Zhu JR, Yuan WG, Qi LZ and Yu AQ, 2007. Carbon storage by ecological service forests in Zhejiang Province, subtropical China. *Forest Ecology and Management* 245: 64-75.

A study finds biomass, litter production, net primary productivity and carbon density all lower in both *Pinus massoniana* and *Cunninghamia lanceolata* plantations than in comparable evergreen broadleaf forest, with mixed coniferous-broadleaf forests intermediate. Evergreen broadleaf forest has great potential for offsetting carbon dioxide emissions. Promoting succession from coniferous to evergreen broadleaf forests can enhance carbon sinks in subtropical China.

研究发现马尾松人工林和人工杉林的生物量、枯枝落叶层的生产、净初级生产力及碳密度都低于面积相若的常绿阔叶林, 针阔叶混交林则介乎两者之间。常绿阔叶林对抵消二氧化碳有较大的潜力。促进针叶林演替为常绿阔叶林可提高中国亚热带地区的碳汇。

- Zhang L, Su ZY and Chen BG, 2007. Interspecific relationships in the forest community dominated by *Pinus kwangtungensis*, an endangered species endemic to China. *Frontiers of Forestry in China* 2 (2): 128-135.

- Zhang RJ, Xing FW, Siu LP, Liu Y, Ye YS, Ng SC, Chen HF and Wang FG, 2007. Spermatophyte flora of Yinggeling Mountain, Hainan. *Biodiversity Science* 15 (4): 382-392.

张荣京、邢福武、萧丽萍、刘演、叶育石、吴世捷、陈红锋、王发国, 2007. 海南鹦哥岭的种子植物区系。《生物多样性》15 (4): 382-392。

- Zhou L, Dai LM, Gu HY and Zhong L, 2007. Review on the decomposition and influence factors of coarse woody debris in forest ecosystem. *Journal of Forestry Research* 18 (1): 48-54.

- Zhou QH, Wei FW, Huang CM, Li M, Ren BP and Luo B, 2007. Seasonal variation in the activity patterns and time budgets of *Trachypitecus francoisi* in the Nonggang Nature Reserve, China. *International Journal of Primatology* 28: 657-671.



伯乐树（国家一级保护）
2003年在鹦哥岭发现的海南新纪录
Bretschneidera sinensis (Class I
Nationally protected species)
A new record to Hainan
discovered in Yinggeling in 2003

我们的首要任务
是要让自己与
他人了解
区内动植物状况

中国项目成立十周年

Happy Birthday “China Team”: the first ten years of the KFBG China Programme

费乐思和刘惠宁 (感谢帮忙编审的陈肇乐及侯智恒)
John Fellowes and Michael Lau
(With thanks to Bosco Chan and Billy Hau)

香港嘉道理农场暨植物园在十年前创立了中国生物多样性保育项目，然而这并非本园首个于国内开展的保育工作，事实上，白理桃女士早在1970年代已活跃于国内植物保育的交流。自1998年2月，华南生物多样性研究队成立，专责缓减广东、广西及海南三省的生物多样性的损耗。该队最初是由植物保育部主管周锦超博士兼管，队员多是研究生态学及动物学的，包括刘惠宁博士、费乐思博士、侯智恒博士（分属植物保育部，更是园内本土树木苗圃的创办人）、韦庚武（分属动物保育部）及李国诚，其后再有留佳宁及萧丽萍的加入（同样分属植物保育部）。如斯重任仅由寥寥数人肩负——该当从何入手？

学习阶段

我们的首要任务是让自己与他人了解区内动植物状况与保育工作。为此，我们针对三省的天然林区，特别是当地的自然保护区，搜集动物类群的数据，并进行一系列快速生物多样性调查，凭藉我们的努力，有效填补这方面的空白。队员们不仅熟悉香港情况，他们亦从1995-1997^{1,2,3}的初步短期考察，累积了在国内野外考察的经验。本园在1997年资助的调查，得到华南农业大学、华南植物研究所、广东及广西林业厅的帮忙，有助增进我们对区内自然保护区的动植物之认识，也深感对它们所知甚少，亦了解到其中一些正面对迫切威胁。藉著与多个不同的研究单位及林业部门合作，在五年多里，我们考察过的林区已有五十多个。

往后的数据汇报并不如调查般「快速」——调查中涉及的多个类群，包括植物、鱼类和昆虫等的鉴定都很费时。为令相关保护区的管理人员对区内的动植物资源有更深认识，记录及诠释考察资料是我们早期的主要工作。此外，我们当时亦要协调开展不久的生态谘询计划，后来才由新加入的同事们接手负责。

在2001年，团队中的人事经历了变动，侯志恒转执教鞭，出任香港大学的讲师，而费乐思和刘惠宁则由全职变为兼职。陈肇乐博士和吴世捷博士此时先后加入，陈早在本队成立之初已参与一些考察，完成博士学位后，便加入中

国项目，他们不仅要处理积压已久的数据以编撰报告，还开展其他调查。编写野外考察报告固然需时，但现在不只完成了英文版^{4,5}，还被陆续翻译成中文版⁶。

资讯传递

藉这些调查^{7,8}，我们慢慢对区内鸟类^{9,10,11,12}、两栖爬行类^{13,14,15}、蜻蜓^{16,17,18,19,20}、蚂蚁^{21,22}的分布与状况有了更深的认知，同时亦掌握了更多有关哺乳类^{23,24,25}、植物^{26,27,28,29,30}和鱼类^{31,32,33}的资料。此外，考察期间发现的多个新种^{34,35,36,37,38,39,40}，这些文章都只是其中一个例子，使分类学研究又向前迈进了一步。调查虽主要由中坚负责，亦得到其他合作夥伴^{41,42}的补充。调查中获取的一大堆数据外界不易获取，当中一些亦较为敏感，经过一轮修缮后，我们已把资料上载⁴³。大部分收集的数据已用于全球、国家及本地的状况评估^{44,45,46,47,48,49,50,51}，同时亦与其他保育单位分享。区内一些保育工作也因而得到国际机构的支援^{52,53,54,55}，并带动几个优秀的自然保护区升格为国家级的水平，包括广西的十万大山和岑王老山，以及海南的五指山和吊罗山。我们亦透过加入中国环境与发展国际合作委员会^{56,57,58,59,60}辖下的生物多样性工作组及后来成立的小组积极推动国内保育。

此外，我们亦尝试了解华南物种面对的威胁^{61,62,63,64}。根据前期调查^{65,3}所得，2000-2006年进行的野生动物贸易监测是本部针对这方面的重点工作之一。这批第一手资料指出区内日益猖獗的野生动物贸易的趋势，更引起国际对亚洲龟类及其他野生动物^{61,66}陷入生存危机的关注。除了提升龟类⁶⁷等个别物种的全球评级，这项监测对政策^{68,69,70,71,72,73}完善也起作用，包括把相关物种列入《濒危野生动植物种国际贸易公约》^{74,75,76}，现在更多人和机构关注并尝试处理华南野生动植物的贸易⁷⁷。在1998年进行的一次快速野生动物市场调查意外发现了一只海南虎斑鳉，当时这种鸟已濒临灭绝⁷⁸，随著我们及合作夥伴的进一步调查，这只鸟的分布比想像中广泛，可是仍旧处于濒危^{79,80,81,82}状况。



考察队成员摄于2001年广东三岳
Members taking part in the field survey to Sanyue, Guangdong in 2001

Ten years ago Hong Kong's Kadoorie Farm & Botanic Garden (KFBG) launched its new biodiversity conservation programme in Mainland China. It was not KFBG's first involvement in the Mainland, with plant conservation exchanges by the late Gloria Barretto since the 1970s. From February 1998 though, we had a team dedicated to minimising biodiversity loss particularly in the southern provinces of Guangxi, Guangdong and Hainan. This South China Biodiversity Team (or "China Team"), initially overseen by KFBG's Flora Conservation Department head Dr Lawrence Chau, comprised ecologists/zoologists Dr Michael Lau, Dr John Fellowes, Dr Billy Hau (shared with Flora Dept., where he founded the native tree nursery), Graham Reels (shared with Fauna Conservation Dept.) and Lee Kwok Shing, joined soon by administrative officer Ruthie Lau and Gloria Siu (also shared with Flora). A big job for a few people – where to start?

Learning curve

Our first need was to educate ourselves, and others, about the status of the biota and of conservation efforts in the region. We embarked on a series of rapid biodiversity assessments of natural forest areas, mainly nature reserves, focusing especially on the faunal groups with large data gaps which could be filled quite efficiently. Besides its wealth of Hong Kong field experience the core team already had positive experience in the Mainland including brief pilot surveys in 1995–1997.^{1,2,3} The KFBG-funded 1997 surveys, conducted with the help of partners at South China Agricultural University, South China Institute of Botany and Guangdong and Guangxi Forestry Departments, had opened our eyes to the rich biota in the region's reserves, but also to the poor state of knowledge about them, and the imminent threats some of them were facing. Now, working with colleagues in various research and forestry institutions, we visited over 50 forest areas over five years.

The surveys were followed by a not-so-rapid reporting process – many surveyed taxa including plants, fishes and insects required a time-consuming identification effort, and recording and interpreting the information for the benefit of management authorities consumed much of the team's time in the early years. Meanwhile other responsibilities vied for attention, including KFBG's new Hong Kong Ecological Advisory Programme, initially coordinated

by the China Team, but for which specialist staff were later recruited.

In 2001 the core Team changed, as Billy Hau moved to The University of Hong Kong to follow his teaching vocation and John Fellowes and Michael Lau became part-time. Meanwhile Dr Bosco Chan, involved in the programme from its beginning but committed to completing his PhD, became available and joined the team, along with botanist Dr Ng Sai Chit. They inherited a reporting backlog, whilst adding to it by undertaking further surveys. At length though, the field reports flowed, in English^{4,5} and then Chinese.⁶

Channelling information

Gradually then,^{7,8} we and our colleagues built a clearer picture of the distribution and status of the region's birds,^{9,10,11,12} amphibians and reptiles,^{13,14,15} dragonflies^{16,17,18,19,20} and ants,^{21,22} and added substantial new information to the existing picture on mammals,^{23,24,25} plants^{26,27,28,29,30} and fishes^{31,32,33} along with numerous taxonomic contributions including the discovery of many new species^{34,35,36,37,38,39,40} (these references being only a sample). The core team's surveys were supplemented by those of supported partners.^{41,42} The huge body of data generated was not very accessible, and often rather sensitive, such that some editing was required before the survey reports could become available online.⁴³ Much of the acquired information has been channelled into global, national and local status assessments,^{44,45,46,47,48,49,50,51} and shared with conservation authorities. It has helped draw international support to conservation in the region,^{52,53,54,55} and supported the upgrading to national status of several outstanding nature reserves, including Shiwandashan and Cenwangaoshan in Guangxi, and Wuzhishan and Diaoluoshan in Hainan. Meanwhile we have contributed to national consultations on conservation, notably through the Biodiversity Working Group and its successors under the China Council for International Cooperation in Environment and Development.^{56,57,58,59,60}

We have also concentrated on understanding threats.^{61,62,63,64} One key contribution has been wild animal market monitoring from 2000 to 2006, building on earlier work.^{65,3} This resulted in unique data on trends in the devastating regional wildlife trade and helped focus international attention on the crisis faced by Asian turtles

*Our first need
was to educate
ourselves, and
others, about the
status of the biota*



海南长臂猿
Hainan Gibbon
Nomascus hainanus

当时国内保育人士
的野外生物学知识
趋于贫乏

定期出版不同类型的刊物，推广自然保育的工作
Various publications are released on a regular basis to promote nature conservation

连结保育力量

《森林脉搏》是中国项目提高保育意识的主要工具，自2000年创刊，每年出版两期。该刊的目标读者群可说是个微妙的组合，主要是由华南不同界别的保育学者（积极和具潜质的）所组成，包括对保育重视程度各异的政府官员、致力推动保育的学者和其他界别的人士。我们希望能够成为他们之间的沟通桥梁，凝聚这班来自五湖四海的保育人士，提供宝贵的资讯、想法及动力，并推动及激发他们发表自己的观点⁸³，然而要读者们直抒己见是具挑战性的，当中尤以官员为甚，并非每位都会畅所欲言，不过亦有一班愿意发表意见及关注^{84,85,86,87,88,89,90,91,92,93}的人士，亦要利用本刊向具启发性的同业致敬^{94,95}。中港的文化差异是我们在出版时遇到的另一挑战，我们对保育范畴的设想与术语与国内有一些距离，我们也不知该如何在技术水平上作定位。读者们反映他们珍视野生动植物记录^{96,97,98,99,100,101,102,103}这一类的生态资讯，我们于是亦继续在本刊分享这方面的资料，同时亦避免变为另一科学期刊。此外，每期亦有切合主题的佳作择录^{104,105,106,107,108,109,110,111,112,113,114,115,116,117,118}，有读者更认为出自本部同事笔下的文章^{119,120,121}是最发人深省的。自第六期开始，我们每期都会与读者探讨一个特定主题，而读者也对此表示欢迎^{122,123}。我们另加插了其他特色，包括华南保育先驱的专访^{124,125,126}和珍稀物种小档案^{127,128,129,130,131,132}。蒙林咏怡及吴狄姬等前编委会成员的努力和贡献，本刊才得以不断进步。我们拟大大提升《森林脉搏》的网上流通性，并将过往期数上载，而印刷本的数量亦会减少。



培育生态学人才

推广生态学即研究生物栖息环境的科学，向来都是本园及中国项目的主要工作，（我们是师承香港大学生态及生物多样性学系，特别有赖高力行和杜德俊两位教授的栽培）。打从1998年到国内考察，我们已察觉到内地野外生物学知识贫乏的困境。当时经验丰富的野外生物科学家已年事渐长，而年青科学家却多数选择高科技而相对安全和不必“上山下海”的学科。通晓物种辨识，又会以欣赏及了解的态度领略本土乡野的生态学者，已越见难求了（这正

是1940年代，北美的李奥波德¹³³所说的生态危机）。嘉道理农场暨植物园奖学金正尝试填补这方面的人才缺口，资助透过野外考察进行的生态学研究，亦给建议令研究的焦点更能应用到保育上去。迄今共资助了约40名研究生，当中已毕业的最少有20人已投身保育界，或继续深造。除了在扶掖后晋这方面取得基本成果以外，他们的研究更发掘了关于哺乳类^{134,135,136,137,138,139,140}、鸟类^{141,142}、植物^{143,144,145,146,147,148,149,150,151}、无脊椎动物^{152,153,154,155,156,157,158}、两栖类¹⁵⁹、鱼类^{160,161,162,163}、爬行类^{164,165,166,167,168,169,170}的大量资料。因此，华南地区的野外考察技能及生态知识也得以提升，纵使人才仍是短缺。近年我们越来越多支援有助推进本部工作的研究题目，同时亦可加强我们与学生的互动。

此外，资源管理的职工亦有提升技术的必要。除了和保护区职工一同考察主要地区（见下文）以外，我们也有与本园动物保育部为香港与广东的执法人员提供培训课程及资助。我们冀望把国际及国家的在生态恢复¹⁷¹、监测与调查^{172,173,92}、自然旅游¹⁷⁴及把生态纳入政策规划¹⁷⁵等经验与华南的保育单位分享。本园以华南森林资源管理¹⁷⁶为题的著作的经已开始翻译，希望很快能对区内管理与培训能派上用场。良好的英语能力可为保育职工带来工作上的方便，他们与国内外同业的合作时有沟通误解，为此我们便协助云南林业厅修订《森林保护实用英语编辑指南》¹⁷⁷（以中译本出版）。

实际行动

我们已把考察的成果转化为实际的保育行动，因此有需要进行策略修订，以处理推动社会不可持续的问题和与自然保育发生的直接冲突，同时亦推广本园更远大的使命，那就是提高大众的环境意识¹⁷⁸。于是，中国项目必须由全职的部门主管领导日后的工作，并向刘惠宁委以重任。随著王丽贤在2004年的加入，对可持续性这一方向起了启导作用，后来她转调到本园的可持续生活及农业部工作。本园既定的清晰策略方针——如可持续生活、关怀自然与保育成效——都已渗透在各个不同计划之中，而中国项目仍旧以保育为重点。

早期进行的保育行动都是有点自儿即发性的，主要是支援其他人的行动，包括在广东增城成立实验乡土树苗圃¹⁷⁹、广西大瑶山设置围栏保护鳄蜥生境¹⁸⁰、协助广西木论保护区的村民购置节能炉（从而减轻对森林造成的压力）。我们深明要保育更为凑效，必须在个别的地区内多下苦功，持续地努力奋斗。我们近年主力在海南开展保育工作^{181,182}，并得到海南林业厅辖下的野生动植物保护中心¹⁸³的欢迎。我们更有幸应邀参与成立鹦哥岭自然保护区的计划，藉此保护海南的森林心脏地带¹⁸⁴，这不仅带来



鹦哥岭自然保护区面积约五百平方公里，是目前海南最大的保护区
With an area of 500km², Yinggeling Nature Reserve is currently the largest reserve in Hainan

and other wildlife.^{61,66} Besides leading to changes in global status of some species, such as turtles,⁶⁷ and outputs directed at improving policy^{68,69,70,71,72,73} including protection under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)^{74,75,76}, more people and groups are now engaged in tackling the South China wildlife trade.⁷⁷ One brief market survey in 1998 led to the rediscovery of the White-eared Night Heron, then feared on the verge of extinction;⁷⁸ further work by partners and ourselves found the species more widespread than thought, but it remains Endangered.^{79,80,81,82}

Linking up the conservation community

Central to the team's conservation awareness-raising function has been *Living Forests*, appearing twice-yearly since 2000. This was always aimed at a tricky target group: the diffuse community of conservationists (active and potential) in the region, comprising government officials with varying degrees of interest in conservation, along with dedicated academics and others. We wanted to help fill a communication gap to unite these disparate individuals, provide them with valuable information, ideas and motivation, and entice them to share perspectives.⁸³ The latter proved challenging particularly for officials, not all of whom are free with their opinions; still, we have found a flow of conservationists willing to share their concerns and reflections,^{84,85,86,87,88,89,90,91,92,93} and pay tribute to inspirational colleagues.^{94,95} An extra challenge was our own cultural "handicap" of being based in Hong Kong, with a different set of assumptions and jargon to Mainland counterparts; we were also uncertain how to pitch it in terms of technical level. Through feedback we found most readers valued ecological detail, including wildlife records,^{96,97,98,99,100,101,102,103} and have tried to reflect this without creating another academic journal. Original articles have been supplemented with a rich stream of excerpts from previously published reflections,^{104,105,106,107,108,109,110,111,112,113,114,115,116,117,118} while readers have rated some of the Team's own articles^{119,120,121} among their favourites. Since Issue 6 we have gone in depth each time into a topical theme, and this has been welcomed by readers.^{122,123} We have also added other features including interviews with conservation pioneers^{124,125,126} and spotlights on regional fauna and flora.^{127,128,129,130,131,132} We acknowledge the past contributions of editorial team members, including Vicky Lam and Norris (Rosario) Ng, to the magazine's

development. We envisage greatly improving the online accessibility of *Living Forests*, past and present, and limiting circulation of the paper version.

Boosting ecological capacity

A guiding theme of the Programme and of KFBG has been to promote ecology, the science of where organisms live (and for our own capacity in this science we acknowledge a debt to The University of Hong Kong's Division of Ecology and Biodiversity, and particularly Professors Richard Corlett and David Dudgeon). From our start in 1998 it was evident that the craft of field biology was in crisis in China. The average age of skilled field biologists was increasing, and young scientists were drawn to "safer" hi-tech disciplines; it was becoming difficult to find scholars who could identify species in the field, or "view their native countryside with appreciation and understanding" (a crisis noted in 1940s North America by Aldo Leopold¹³³). Our KFBG Studentships tried to help fill this gap, supporting dedicated postgraduates in their studies on ecological subjects especially built on fieldwork, and often helping them tighten the conservation focus of the projects. Almost 40 students have been supported to date, of whom at least 20 successful graduates are currently employed in the field or engaged in further research. Besides this primary "product", of better-informed scientists, the studies have led to a range of outputs, on mammals^{134,135,136,137,138,139,140} birds,^{141,142} plants,^{143,144,145,146,147,148,149,150,151} invertebrates,^{152,153,154,155,156,157,158} amphibians,¹⁵⁹ fishes^{160,161,162,163} and reptiles.^{164,165,166,167,168,73,169,170} Thus the region's field and ecological capacity has been bolstered, though a shortage remains. Increasingly we have supported studies supporting other programme goals, to enhance our interactions with the students.

Resource managers too have been in need of a technical boost. Besides working with reserve staff at key sites (see below), along with KFBG Fauna Dept. staff we have organised or supported training of enforcement officers in Hong Kong and Guangdong. We have sought to direct the fruits of international and national experience to South China on key areas such as ecological recovery,¹⁷¹ monitoring and research,^{172,173,92} nature tourism¹⁷⁴ and integrating ecology into policy.¹⁷⁵ The first edition of our book on managing South China's forests for biodiversity¹⁷⁶

*It was evident
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in crisis*

乐小山 (左) 致力把兼具粮食生产与生物多样性保护等生态系统功能的土地利用方法和概念, 注入农地的设计与规划中
Hil Padilla (left) strives to incorporate integrated land-use approaches and concepts (with elements of food production and biodiversity conservation) into the design and planning of farm plots



我们有幸参与
成立海南鹦哥岭自然保护区,
以保护海南森林
的心脏地带

大量的动植物资料^{185,186,187,188,189,190,191,192,193}, 我们更与保护区管理层紧密合作, 本部的陈辈乐更在该区挂职, 出任特别副站长。新职工的培训计划亦已陆续开展。在霸王岭自然保护区, 我们应邀成为合作伙伴, 共同保护极危的海南长臂猿, 除了于2003年¹⁹⁴进行长臂猿种群的彻底调查及保育研讨会, 我们随后亦向保护区及科学专才提供资助, 落实多个与会者一致认同的优先保育行动¹⁹⁵, 如加强巡护监测、扩大生境、明了生境利用及社区参与的推广^{196,197}。另外包括吴世捷带领的海南喀斯特生态系统的研究与保护^{198,199}, 促成了俄贤岭重要石灰岩森林的保护, 而湿地及森林的进一步研究也令当局更清楚了解及确认出优先保育的地区^{200,201}。为激励保护区职工更积极参与保育事业, 去年我们更开设了一个针对他们的资助计划, 并收到25个保护区共38份申请, 首批获资助的项目正在开展。

以人为本

保育要顾及的重要因素, 是当地人及他们如何在自然保护区周边获取资源^{202,203}。虽然一些矛盾是在所难免, 但我们相信保育与当地社区采取更合乎生态的土地管理方式存在著一定的互补性^{204,205,206,207,208,209}。2006年加入的乐小山, 他不单是资深的生态农业专家, 更是本园的前农业部主管, 熟谙在东南亚地区的可持续农业发展概况。藉著与其他慈善团体的合作, 在国内举办了一系列的工作坊与活动, 亦开始倡导与黎族村民及鹦哥岭职工发展整合而睿智的农业模式, 使农业与自然保育相得益彰。与此同时, 他亦开始让其他队员明白到农民重视的各个观点。当地社区将会是今后推动教育项目的重要一环, 他们丰富的野外知识能为可持续资源管理提供稳固的基础。

我们计划和其他教育工作者/增效群以及《森林脉搏》的读者^{210,211}合作, 深化现时的教育工作。我们以往曾协助大明山制作游客教育资料¹⁸⁰, 和为海南师范大学的老师^{212,213}提供培训, 亦支援物种的鉴别如海南脊椎动物动物图鉴的相关物种²¹⁴。考察所得的科学讯息有不少已被引进自然旅游的出版物²¹⁵, 而我们拍得的照片也多番被外界用来编制网上教材。建基于本部前教育及意识推广主任周嘉旺订下的教育策略, 现时这方面的工作已渐见雏型, 核心成员包括朱咏贤、罗益奎、林芷薇和卢刚, 我们已著手在园内设立中国项目展览专区, 并为海南野的动植物类群, 筹备野外图鉴。

本园的使命及稳定的资源确实为我们的工作带来难得的机遇, 但我们却不会视此为理所当然, 并常常提醒自己需要改善工作表现。但此刻, 我们应为共同保育天然遗产所作出的成果而感到自豪, 保育是善业¹¹⁵。

下一个十年

下一个十年将会如何? 要落实具体的保育大计确实不容易, 瞬息万变的大气候——不论是实质的还是社会性的——都可以一下子令工作的优先次序与机遇改变。有感我们正与环境质素下降与提高全民意识竞赛, 能使之改变的是意识之提高, 新科技可以促进两者的发生, 可是前者却一直遥遥领先。我们中国项目希望能作出抗衡, 引领大众去用另一个角度去评价自然, 保育自然。我们尝试逐步协助他人追寻恒久的价值——以贯彻本园向来鼓吹的「助人自助」的理念。假若首个十年可作借鉴, 我们预期将会遇到困难及尝到成功, 而付出的努力是值得及难忘的。我们谨此感谢众多引导我们、与我们风雨同路的夥伴, 亦期望彼此能并肩经历往后的另一个十年, 一个充满生物多样性的将来并非没有可能的! (森)

is being translated and will, we hope, become a useful source for management and training throughout the region. Since English proficiency is beneficial to conservation staff in various ways, and since there is much miscommunication between colleagues inside and outside China, we have also helped Yunnan Forestry Department produce guidelines (in Chinese) on editing English for forest conservation.¹⁷⁷

Action on the ground

As the thrust of our programme moved from information-gathering to action, we refined strategies to address “driver” problems of societal sustainability as well as “symptoms” of direct conflict with nature, and promote KFBG’s broader mission of increasing environmental awareness.¹⁷⁸ The broader China Programme (CP) required a full-time head, and Michael Lau was duly appointed. In 2004 we were joined in CP by Idy Wong to spearhead the new sustainability direction, subsequently transferred to a separate Department of Sustainable Living and Agriculture. While KFBG’s crystallising strategic directions – sustainable living, compassion for nature and conservation impact – suffuse all its programmes, CP retains its conservation emphasis.

Our early direct conservation actions had been somewhat ad hoc, supporting others’ initiatives; they included support for the experimental native tree nursery at Zengcheng, Guangdong,¹⁷⁹ fencing to protect the habitats of Crocodile Lizards at Dayaoshan, Guangxi,¹⁸⁰ and helping villagers at Guangxi’s Mulun Nature Reserve buy more fuel-efficient stoves (reducing pressure on the forest). For more effective conservation we knew we would need sustained involvement in particular areas. The new CP has worked mostly in Hainan,^{181,182} encouraged by the welcome of our partners the Hainan Wildlife Conservation Centre in the provincial Forestry Department.¹⁸³ At their invitation we have proudly contributed to the creation of the great Yinggeling Nature Reserve protecting the island’s forest heartlands.¹⁸⁴ Besides spawning a host of biodiversity findings^{185,186,187,188,189,190,191,192,193} we continue to work closely alongside the reserve’s new management team, where Bosco Chan is now a part-time seconded special deputy director. Training of the new staff is ongoing. At Bawangling we were invited to convene a partnership to conserve the Critically Endangered Hainan Gibbon; besides organising a comprehensive population survey and international conservation workshop in 2003,¹⁹⁴ we have helped the reserve and scientists fund and implement many of the agreed priority actions,¹⁹⁵ such as improved patrolling and monitoring, expansion of habitat, understanding habitat use and early steps toward community engagement.^{196,197} Elsewhere a project led by Ng Sai Chit to study and conserve the island’s karst ecosystems^{198,199} has initiated protection of the important forest of Exianling, while further studies on wetlands and forests have added to the authorities’ understanding of priority sites.^{200,201} To spark and reward more proactive engagement from reserve staff, last year we launched a new grant scheme aimed at them, and the first successful projects, from 38 applicants in 25 reserves island-wide, are under way.

Bringing people on-side

A key dimension of conservation is of course the local human population, and how they are obtaining their resources especially around the edges of nature reserves.^{202,203} While some conflicts are inevitable, we believe there is great scope for synergy between institutional conservation and more ecological approaches to land management by communities.^{204,205,206,207,208,209} Since 2006 our team has included Hil Padilla, a veteran of sustainable farming in Southeast Asia and former head of KFBG’s Agriculture Department. He has undertaken a range of workshops and other activities alongside partner charities across China, and has begun working with Li villagers and reserve staff at Yinggeling toward integrated and intelligent farming systems that work with nature; he has also begun educating the rest of our Team as to the all-important farmer’s perspective. Local communities will be key in our future education work, where their field knowledge is a strong foundation for building more sustainable resource management.

We also plan to deepen the education component of our work by working with other key multiplier groups; not least, *Living Forests* readers.^{210,211} We have contributed to visitor education materials at Damingshan¹⁸⁰ and Hainan Normal University,^{212,213} and to initiatives enabling identification, such as a key to Hainan’s vertebrates.²¹⁴ Meanwhile our scientific information has been taken up in nature tourism publications,²¹⁵ while our photographs are widely used in online educational tools.²¹⁶ Building on the strategy initiated by Sharon Chow, our new team including Wylie Chu, Philip Lo, Ela Lam and Lu Gang is keen to take the education work forward; we have begun with a permanent China exhibition at KFBG itself, and are working on a series of accessible regional field guides on select wildlife groups.

The mission and stable resources of KFBG have given us an opportunity we never take for granted. We are constantly aware of the need to improve our effectiveness. For a moment though, we should all take pride in our collective efforts to look after natural heritage. Conservation *is* good work.¹¹⁵

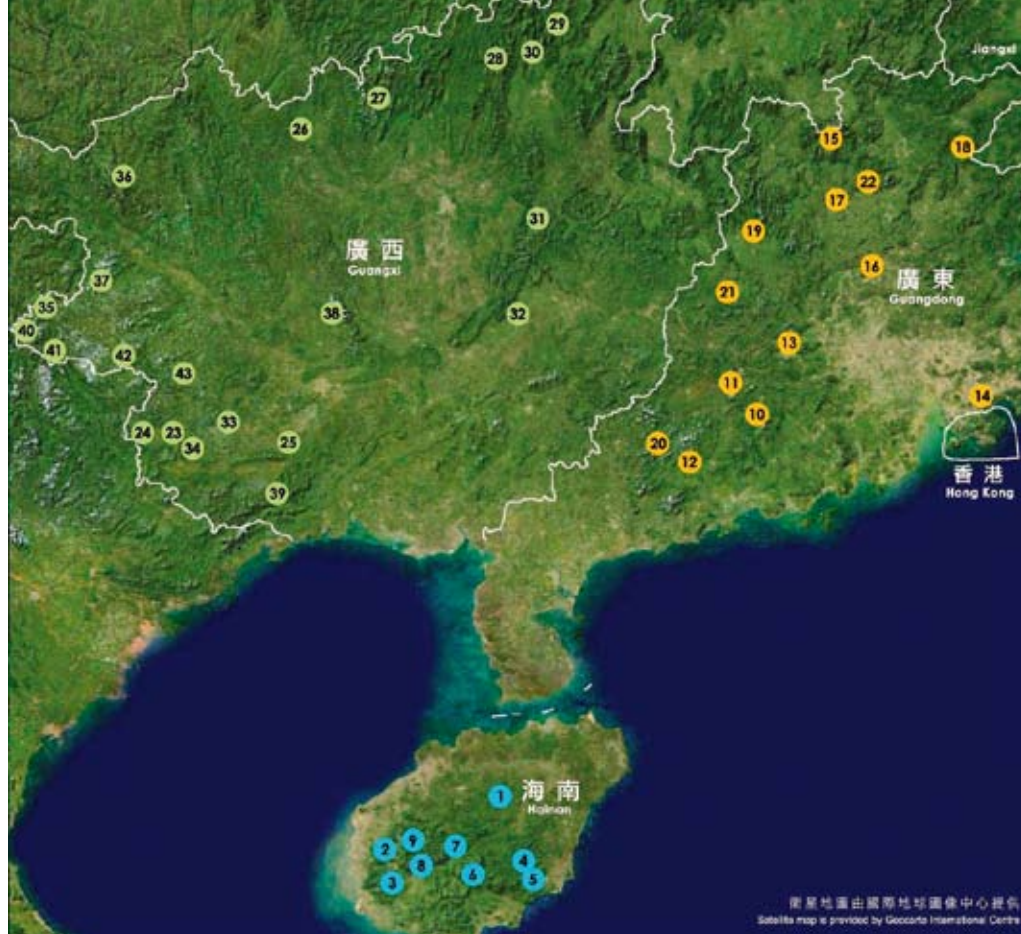
The next decade

So what will the next ten years bring? It’s difficult to make firm plans in conservation; the dynamic climate – physical and social – can quickly change priorities and opportunities. It feels we are in a race between environmental decline and the awareness needed to reverse it; new technology could accelerate both, but the former has a big head start. In CP we hope to bring a counterbalance, contributing to how nature is valued and conserved. We seek increasingly to support others in their pursuit of lasting values, at Yinggeling and elsewhere. In this the original Kadoorie Farm philosophy, “helping people to help themselves”, still applies. If the first decade is anything to go by, while we can all expect difficulties as well as successes, the effort will be worthwhile and memorable. We thank the many people who have guided us and worked alongside us up to now, and look forward to our further collaboration. A biodiverse future is still possible! 🌿

*We have proudly
contributed to
the creation
of the great
Yinggeling
Nature Reserve
protecting the
island’s forest
heartlands*

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已进行快速生物多样性调查的40多个森林地区，结果亦已编写及出版成考察报告

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中国“倒计时2010”行动： 宣扬生物多样性的重要性

Countdown 2010 in China: communicating the importance of biodiversity

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倒计时2010行动于2007年9月展开，目的是凝聚中国的有关组织，共同宣扬制止生物多样性消失的迫切需要。

生物多样性在中国的情况

以中国的物种数量和特有种数量计，中国是全球其中一个生物多样性最丰富的地区¹，居住著全球近15%的哺乳动物、14%的鸟类、18%的鱼类和12%的维管植物。此外，中国也是不同驯化及栽种品种的重要发源地，例如：包括约600个旱地农作物的品种²。

中国的生物多样性不仅支持著人民的健康和生活，还关系著国家的经济发展。虽然难以精确地计算出生物多样性所带来的好处及服务，但根据“中国环境与发展国际合作委员会”（CCICED）生物多样性工作小组在1995年估计，每年约值2,550亿至4,100亿美元³。

在“保护国际”（Conservation International, 简称CI）所识别的34个热点地区中，有4个位处中国境内，或延伸至中国境内，这显示出中国物种的丰富及其生物多样性受威胁的情况。一个热点地区必须有至少1,500种特有的维管植物，并已失去最少70%的原来生境⁴。

生物多样性备受威胁

中国的天然资源正受到严重威胁，根据2007年“世界自然保护联盟”的《受威胁物种红色名录》，中国有大量物种正面临绝种的危机。在2,882个红色名录的物种中，超过四份一被列为受威胁物种（归类为易危、濒危或极危）⁵。

中国人口庞大，经济增长迅速，是可持续发展的重大机遇及挑战。虽然其国民生产总值在过去十年持续增长，使数以百万计的人民得以脱贫，并成为全球其中一大经济体系，但根据2005环境可持续性指数（Environmental Sustainability Index, 简称ESI）⁶，在146个国家中，中国排行第133位。经济迅速增长，加上对环境管治宽松，造成广泛污染及生境破坏，导致河流、森林及耕地受到威胁，亦对生物多样性带来严重影响。

除生境破坏外，对濒危野生动物的消耗，还有外来物种的入侵，都对日渐下降的生物多样性造成持续的影响。云南省是中国其中一个生物多样性最丰富的省份，纪录有432种淡水鱼，其中三分一是受威胁或已绝种的。过量捕鱼、兴建水坝、水污染及外来物种入侵等，都

到北京参与“倒计时2010”启动仪式的合作伙伴们
Countdown 2010 partners
at launch in Beijing



Photo by Author



Photo by Author
青海的鸟岛是中国的自然保护区之一
Bird Island, Qinghai Province, one of China's protected areas

Launched in September 2007, the Countdown 2010 initiative is bringing together organizations in China to communicate the urgent need to halt the loss of biodiversity.

Biodiversity in China

China is one of the world's centres of megadiversity¹, by virtue of the numbers of taxa found in the country and of the number of endemic species represented. The country is host to nearly 15% of the world's mammals, 14% of its birds, 18% of its fishes, and 12% of its vascular plants. It is also an important source of domesticated species diversity: for example, about 600 varieties of dryland crops².

China's biodiversity supports not only the health and wellbeing of its citizens, but also the country's economic development. While the benefits and services provided by biodiversity cannot be precisely calculated, in 1995 the China Council for International Cooperation on Environment and Development (CCICED) Biodiversity Working Group estimated that in China they were worth between US\$255 and US\$410 billion per year³.

China's species richness and the vulnerability of its biodiversity are demonstrated in its hotspots – four of the 34 hotspots identified by Conservation International (CI) are in or extend into China. A hotspot must contain at least 1,500 species of vascular plants as endemics and to have lost at least 70% of its original habitat⁴.

Biodiversity under threat

China's natural capital is severely threatened. The global IUCN Red List of Threatened Species (2007) found China to have a large number of species in danger of extinction; of the 2,882 Red-List assessed species found in China, over a quarter are considered Threatened (classed as Vulnerable, Endangered or Critically Endangered)⁵.

With its large population and growing economy, China represents big opportunities and big challenges for sustainable development. Although China's sustained GDP growth in the last decade has lifted millions of Chinese out of poverty and created one of the world's strongest economies, the 2005 Environmental Sustainability Index⁶ ranked China 133rd out of 146 countries. Rapid economic growth and lax environmental governance has resulted in widespread pollution and habitat destruction,

threatening China's rivers, forests and arable land, and having a severe impact on biodiversity.

As well as habitat loss, the consumption of endangered wildlife and alien invasive species continue to have an impact on China's declining biodiversity. Yunnan Province, one of China's richest provinces in terms of biodiversity, has 432 documented freshwater fish species, of which about one third are either threatened or already extinct. Overfishing, dam construction, water pollution and invasive alien species have also been linked to local extinctions and population reductions. For example, by the early 1970s, more than 30 alien fish species had been introduced into Yunnan's Dianchi Lake, while the number of indigenous species declined from 25 in the 1940s, to 15 in 1978 and 8 in 1982⁷. Meanwhile Elizabeth Economy notes the case of slowly starving monkey populations around Shenzhen, as local banana trees that have traditionally supplied them are losing the battle against an alien plant species, the South American Climber⁸.

Changing policy focus

The Central Government, as well as civil society, increasingly recognizes the environmental and health costs of China's development model, and recent government policies and statements have emphasized the need to protect the environment as well as grow the economy. The Chinese government and World Bank analyses suggest that if inequality and sustainability issues are not addressed, economic growth could falter⁹.

At the national level, the growing importance attached to environmental issues and biodiversity is clearly demonstrated in both legislation and rhetoric. China's 11th Five-Year Plan, for 2006–2010, includes an ambitious vision for "harmonious development". On May 22nd 2007, International Biodiversity Day, a representative of China's State Environmental Protection Administration (SEPA) called for biodiversity to be "regarded as a key performance indicator."¹⁰ Relevant ministries and agencies, such as those responsible for environmental protection, forestry, construction and agriculture, have also developed numerous policies and initiatives aiming to mitigate biodiversity loss in China.

Internationally, China is a signatory to all major environmental conventions and an active participant in those related to biodiversity: the World Heritage

中国大规模植林的 质素欠佳， 且物种不多， 管理亦欠妥善

与物种灭绝及数量减少有关。例如在1970年代早期，云南滇池引入了逾30个外来鱼种，而本土鱼则由1940年代的25种降至1978年的15种，及至1982年，更只剩下8种⁷！此外Elizabeth Economy亦指出，深圳附近有一猴群正逐渐受到饥饿的威胁，原因是当地的蕉树渐渐被外来物种薇甘菊所取代，令猴群失去一直赖以维生的食物⁸。

改变政策焦点

中央政府及民间进一步认识到中国的发展模式所引致的环境及健康成本，近期的政府政策及言论都强调保护环境及经济增长的需要。中国政府及世界银行的分析皆指出，如果没有好好解决资源不均及持续发展两大事项，经济增长或会受拖累⁹。

在国家的层面上来说，对环境议题及生物多样性的重视，清楚地体现于立法及宣传上。中国的第十一个五年计划(2006至2010)便包括了主题为“和谐发展”的愿景，可说是积极进取。在2007年5月22日举行的“国际生物多样性日”上，来自中国国家环境保护总局(SEPA)的代表呼吁将生物多样性“视为主要的表现指标”¹⁰。有关部门及机构，例如负责环境保护、林业、建设与农业的，纷纷制定许多政策和行动，以舒缓中国生物多样性消失的情况。

在国际的层面上来说，中国是所有重要的环境公约的签约国，亦积极参与有关生物多样性的公约，其中包括：《世界遗产公约》、《濒危野生动植物种国际贸易公约》、《拉姆萨尔公约》、《生物多样性公约》(CBD)，及气候变化和沙漠化的框架公约。中国是首个承认CBD的主要国家，并在国内采取积极措施执行有关公约，并根据第6条，于1993年制定保育生物多样性行动计划。SEPA于2005年9月发表了中国向CBD提交的第三份国家报告，中国将所有CBD的项目、条文及工作计划都列作“高度”优先处理，而旱地及半湿润地生物多样性和山区生物多样性则被列作“中度”优先处理¹¹。

近期减低生物多样性消失的行动包括大幅增加保护区面积及森林覆盖的计划。国家林业局(SFA)的目标是到2020年可以有2,300个自然保护区归其辖下管理，以保护森林、野生动物及其他自然资源，面积总计为140万平方公里，或中国土地总面积的14.5%。国家林业局副部长祝列克表示，这些保护区将可保护国内95%的国家重点保护野生动植物物种，这些保护区亦包含了所有典型的生态系统。此外，中国亦订下增加森林覆盖率的目标：由2006年的18.2%增至2010年的20%及2020年的23%¹²。

停止生物多样性消失所面对的挑战

就如CBD的所有缔约国一样，中国亦决意“在2010年或之前，大幅减低生物多样性消失的速度”，并已进行多次讨论，以期使2010年的目标既可量度，亦可实现(见附录1)。然而，尽管中国一直努力不断，并曾在环境政策上作出重大转变，但和许多其他国家一样，离上述目标还有一段距离。

虽然中国有涵盖面广泛的保育生物多样性国家政策和计划，但执行起来，尤其是在地区层面却遇到很多挑战。欠缺能力、意识及特别针对保育生物多样性的有效措施，皆导致中国一些最为重要的环境保育项目未能有效发挥作用。举例：中国自1998年起禁止在国内砍伐天然林，并进行大规模植林，结果虽然增加了森林覆盖率，但不少植林质素欠佳，且物种不多，管理亦欠妥善⁸。最为重要的环境保育项目未能有效发挥作用。举例：中国自1998年起禁止在国内砍伐天然林，并进行大规模植林，结果虽然增加了森林覆盖率，但不少植林质素欠佳，且物种不多，管理亦欠妥善⁸。

尽管中国在减慢沙漠化上取得成绩，但旱地退化(根据CBD的第5个目标，土地质素下降亦视为对生物多样性的威胁)仍然是重要问题。虽然在向CBD提交的第三份国家报告中，这并不属于高度优先处理的项目，但中国土地逾43%被视为旱地¹³，约有一亿人口居住其中，并拥有中国一些最脆弱的生态系统及濒危物种。中国的旱地退化问题严重，估计近90%的草原面积，出现某程度上的退化，当中约34%属中度至严重程度¹⁴。

中国的生物多样性所受的基本威胁，政策及执行工作所遇到的挑战包括：

能力

中国要减低生物多样性的消失，最大的挑战也许是能力及资金不足。在中国向CBD的COP所提交的第三份国家报告中提到：“缺乏财力、人力及技术的资源”几乎被普遍视为对履行CBD的严峻挑战¹¹。此外，中国亦缺乏足够的科研能力以支持CBD的各项目标，而科技及技术专才的转移亦不足¹¹。

权力

由于中国国家环境保护总局并不享有政府部级的地位，故权力有限，在改善中国环境管治的过程中，往往会遇到困难(虽然这情况可望在2008年改变)。再者，将权力下放到资源和人力都不足够的地方性环境保护局去，加上贪污问题，令执行有关环境的规条倍加困难。

表一：在中国的受威胁物种（以分类学划分）⁵

Table 1: Threatened species in China (by taxonomic group)⁵

	香港特别行政区 Hong Kong SAR	澳门特别行政区 Macau SAR	台湾 Taiwan	中国(其他地区) China (other)
哺乳类 Mammals	1	0	13	83
鸟类 Birds	15	3	20	86
爬虫类 Reptiles	1	0	8	31
两栖类 Amphibians	3	0	9	85
鱼类 Fishes	14	6	37	60
软体动物 Molluscs	1	0	1	1
其他无脊椎动物 Other invertebrates	2	0	0	5
植物 Plants	6	0	78	446
总数 Total	43	9	166	797

Convention, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Ramsar Convention on Wetlands, the Convention on Biological Diversity (CBD), and the framework conventions on Climate Change and Desertification. China was the first major state to ratify the CBD, and at the national level has taken active measures to implement it. In accordance with Article 6, in 1993 China formulated a Biodiversity Conservation Action Plan. In China's Third National Report to CBD, published by SEPA in September 2005, China accords a "high" level of priority to all CBD articles, provisions, and programmes of work, with the exception of dryland and sub-humid land biodiversity and mountain biodiversity (both accorded "medium" priority)¹¹.

Recent initiatives to reduce the loss of biodiversity include plans to significantly increase protected areas and forest cover. The State Forestry Administration (SFA) aims to have 2,300 nature reserves under its jurisdiction by 2020, for the protection of forest, wild animals and other natural resources, with a combined area of 1.4 million km², or 14.5% of China's total land area. According to SFA Vice-Minister Zhu Lieke, these reserves will protect 95% of the country's plant and wild animal species under state "key protection" and represent all typical ecological systems. China also aims to increase forest cover from 18.2% (in 2006) to 20% by 2010 and 23% by 2020¹².

Challenges to halting the loss

Like all Parties to CBD, China is committed to "achieve by 2010 a significant reduction in the rate of biodiversity loss." Considerable discussion has gone into making this "2010 Target" measurable and achievable (See Appendix 1). But despite ongoing efforts and a major shift in environmental policy, China is one of many countries poised to fall short of reaching this target.

Although China's national policies and plans for biodiversity conservation are large in scope, there are many challenges to implementation, particularly at the local level. The lack of capacity, awareness and effective measures specifically targeting biodiversity conservation means that some of China's most important environmental programmes are not effectively protecting biodiversity. For example, China's domestic logging ban (since 1998) and large-scale afforestation programme have seen forest cover

increase, yet the quality of Chinese forests often remains low, with a lack of species diversity and poor management⁸.

Dryland degradation (land degradation is included as a threat to biodiversity in Goal 5 of the CBD targets) remains a significant problem, despite China's overall achievement in reducing the rate of desertification. Although not a high priority area in its Third National Report to the CBD, more than 43% of China's territory can be classified as dryland¹³, and this is home to around 100 million people as well as to some of China's most fragile ecosystems and endangered species. China's drylands are also highly degraded, with estimates suggesting that about 34% of all grassland areas are moderately to severely degraded and about 90% are degraded to some degree¹⁴.

Underlying the clear threats to biodiversity in China, policy and implementation challenges include the following:

Capacity

Perhaps the most prominent challenge to reducing the loss of biodiversity in China is inadequate capacity and funding. In China's Third National Report to the COP of the CBD, "[l]ack of financial, human, and technical resources" was seen almost across the board as a "high challenge" to implementation of the CBD¹¹. China also lacks adequate scientific research capacities to support all CBD objectives, and the insufficient transfer of technology and technical expertise are consistently seen as challenges to CBD implementation¹¹.

Authority

A prominent difficulty in improving environmental governance in China is the lack of authority accorded to SEPA, which does not have the status of a ministry, although this is expected to change in 2008. In addition, the devolution of authority to under-resourced and under-staffed local environmental protection bureaus, as well as corruption, exacerbates problems in enforcing environmental regulations.

Awareness

Another significant challenge is lack of awareness about biodiversity and how it supports the health of ecosystems, particularly among the business community and the

The quality of Chinese forests often remains low, with a lack of species diversity and poor management

意识

另一大挑战是对保育生物多样性意识不足，对其如何支持健康的生态系统亦认识不够，这情况在商界及普罗大众间尤其普遍。在中国的野生动植物非法贸易，以及用濒危物种制作中药或作为食物，都是例证。而好像鲨鱼鳍(鱼翅)和濒危药用植物(包括来自世界其他地方的物种)等产品的贸易已持续地对生物多样性造成影响。

在中国开展的倒计时2010行动

倒计时2010是由一群合作夥伴组成的网络，目的是通过支持有关政府，以期在2010年或以前减少生物多样性消失。这个行动于2004年在欧洲开展，现有来自全球近300个夥伴，包括CBD；国家、区域性、地区性政府；私营机构；以及众多非政府组织。至2007年，倒计时2010更进一步发展为全球性的行动，于非洲、南美洲、亚洲，以至最近在中国，均设立了枢纽中心。

倒计时2010在中国的目的是宣扬生物多样性的的重要性及其保育工作。此行动于2007年9月在

中国开展，逾20个中国及活跃于中国的国际组织已签署《倒计时2010声明》，并加入了区域网络。合作夥伴由地区性的非政府环保组织，如“北京地球村”；到活跃于中国的大型国际保育组织，如“大自然保护协会”；以至政府辖下的组织，如“南京环境科学研究所”，以及“联合国开发计划署(中国)”。

除合作夥伴外，倒计时2010亦有广泛的支持者，但仍十分积极拓阔其接触面，所以成员及支持者的首要工作是接触私营机构及政府。现时虽有政府辖下的机构加入倒计时2010，亦有政府代表参与有关活动，却没有中国政府部门签署《倒计时2010声明》。

2010年已步近，生物多样性的消失正于全球加速，寻求减缓之法已迫在眉睫。2007年11月，倒计时2010与“中国-欧盟生物多样性项目”(简称ECBP)宣传教育子项目联合赞助了一个关于建立联盟的会议，该会议进一步确定中国保育组织对携手合作宣扬生物多样性的的重要性之决心。🌳

逾20个中国及
活跃于中国的
国际组织已签署
《倒计时2010声明》

包括高黎贡山在内的中国西南山区，是世界生物多样性热点之一。
The "Southwest China Mountains", including Gaoligongshan, is one of the biodiversity hotspots of the world.



Photo by Bosco Chan@KFBG


broader public. One manifestation of this problem is the illegal wildlife trade in China and consumption of endangered species in Chinese traditional medicine and at the table. The trade in products such as shark fin and endangered medicinal plants (and species from other parts of the world) continues to have an impact on biodiversity.

Countdown 2010 in China

Countdown 2010, a network of partners working together towards the 2010 target, aims to support governments in their efforts to reduce biodiversity loss by 2010. Launched in Europe in 2004, Countdown 2010 now has nearly 300 partners worldwide, including the CBD, national, regional and local governments, private sector organizations, and a wide range of NGOs. In 2007 Countdown 2010 expanded to become a global initiative, with the establishment of hubs in Africa, South America and Asia, and most recently, in China.

Countdown 2010 in China aims to communicate the importance of biodiversity and the work being carried out to conserve it. Since its launch in September 2007, a diverse group of more than 20 Chinese and international organizations active in China have signed the Countdown 2010 Declaration and joined the regional network. Partners range from local environmental NGOs such as Global Village Beijing, to big international conservation organizations active in China, such as The Nature Conservancy, to government-affiliated organizations such as the Nanjing Institute of Environmental Sciences (NIES), to the UN Development Programme – China.

Beyond its partners, Countdown 2010 has a broad range of supporters, and there is significant interest in expanding its reach. Priorities among members and supporters include engaging the private sector and government. At present, although government-affiliated institutions have joined the initiative and government representatives have participated in Countdown 2010 events, no Chinese government ministry has signed the Countdown 2010 Declaration.

As 2010 approaches and the rate of biodiversity loss accelerates worldwide, the urgency of finding ways to reduce this loss becomes increasingly clear. In November, Countdown 2010 co-sponsored an alliance-building meeting with the EU – China Biodiversity Programme (ECBP) Visibility and Awareness Component (VAC). This meeting further confirmed the willingness of Chinese conservation organizations to collaborate on communicating the importance of biodiversity. 

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*More than
20 Chinese and
international
organizations
active in China
have signed the
Countdown 2010
Declaration*

附录1 - 阐释《生物多样性公约》之2010年目标

焦点范畴：保护生物多样性的组成部份

目标1：促进生态系统、生境及生物群落的生物多样性保育工作

- 指标1.1：令全球各个生态区域里，至少有10%的面积得到有效的保育。
- 指标1.2：保护对生物多样性有特别重要性的地方。

目标2：促进物种多样性的保育工作

- 指标2.1：对特选的分类群物种，作出修复、保留或减缓其数量下降的工作。
- 指标2.2：改善受威胁物种的状况。

目标3：促进对基因多样性的保育工作

- 指标3.1：保育农作物、牲畜，供食用的树种、鱼类和野生动植物，以及其他珍贵品种的基因多样性。

焦点范畴：促进可持续使用生物资源。

目标4：促进可持续使用及消费

- 指标4.1：当使用以生物多样性为基础的产品时，要确保产品来自以可持续方式管理，而生产地的管理亦与保育生物多样性的理念相符。
- 指标4.2：当使用生物资源时，减少不能持续的消费，或减低消费对生物多样性的影响。
- 指标4.3：没有任何野生动植物因国际贸易而变成濒危。

焦点范畴：针对生物多样性所受的威胁

目标5：减低生境消失、土地退化和用途改变，及不可持续用水的情况

- 指标5.1：减低自然生境消失及质量下降的速度。

目标6：控制外来物入侵种所带来的威胁

- 指标6.1：控制外来种的主要潜在入侵途径。
- 指标6.2：对威胁到本土生态系统、生境或物种的入侵物种制定适当的管理计划。

目标7：应付因气候变化及污染而对生物多样性带来的挑战

- 指标7.1：保持及强化生物多样性组成部份的韧力，以适应气候的改变。
- 指标7.2：减少污染及其对生物多样性造成的影响。

焦点范畴：维持来自生物多样性的产品和服务，以保人类福祉

目标8：维持生态系统的运作所提供产品及服务以供生计

- 指标8.1：维持生态系统的运作所提供的产品及服务。
- 指标8.2：维持生物资源，以助可持续生活，当地食物的保证及居民的健康，尤其针对贫困人士。

焦点范畴：保护传统知识、创意及运作方式

目标9：维持原住民及当地社区的多元社会文化

- 指标9.1：保护传统知识、创意及运作方式。
- 指标9.2：保护原住民及当地社区有关其传统知识、创新技术及运作方式方面的权益，包括共享有关利益的权利。

焦点范畴：确保能公平、公正地共享因使用遗传资源所带来的利益

目标10：确保能公平、公正地共享因使用遗传资源所带来的利益

- 指标10.1：确保所有遗传资源的转移皆符合《生物多样性公约》、粮食和农业植物遗传资源国际条约及其他适用的协议。
- 指标10.2：以商业及其他方式使用遗传资源所得的利益，当与提供这些资源的国家共享。

焦点范畴：确保能提供足够资源

目标11：提升缔约国在财政、人文、科学、技术及科技方面的能力，以履行《生物多样性公约》

- 指标11.1：根据公约第20条，将新增的财政资源转移予发展中的缔约国，使其能有效地履行对公约所作之承诺。
- 指标11.2：根据公约第20条第4段，将科技转移予发展中的缔约国，使其能有效地履行对公约所作之承诺。

Appendix 1. Clarifying the 2010 Target: focal areas, goals and targets under the CBD

Focal Area: Protect the components of biodiversity

Goal 1: Promote the conservation of the biological diversity of ecosystems, habitats and biomes.

- **Target 1.1:** At least 10% of each of the world's ecological regions effectively conserved.
- **Target 1.2:** Areas of particular importance to biodiversity protected.

Goal 2: Promote the conservation of species diversity.

- **Target 2.1:** Restore, maintain, or reduce the decline of populations of species of selected taxonomic groups.
- **Target 2.2:** Status of threatened species improved.

Goal 3: Promote the conservation of genetic diversity.

- **Target 3.1:** Genetic diversity of crops, livestock, and of harvested species of trees, fish and wildlife and other valuable species conserved, and associated indigenous and local knowledge maintained.

Focal Area: Promote sustainable use

Goal 4: Promote sustainable use and consumption.

- **Target 4.1:** Biodiversity-based products derived from sources that are sustainably managed, and production areas managed consistent with the conservation of biodiversity.
- **Target 4.2:** Unsustainable consumption, of biological resources, or that impacts upon biodiversity, reduced.
- **Target 4.3:** No species of wild flora or fauna endangered by international trade.

Focal Area: Address threats to biodiversity

Goal 5: Pressures from habitat loss, land use change and degradation, and unsustainable water use, reduced.

- **Target 5.1:** Rate of loss and degradation of natural habitats decreased.

Goal 6: Control threats from invasive alien species.

- **Target 6.1:** Pathways for major potential alien invasive species controlled.
- **Target 6.2:** Management plans in place for major alien species that threaten ecosystems, habitats or species.

Goal 7: Address challenges to biodiversity from climate change, and pollution.

- **Target 7.1:** Maintain and enhance resilience of the components of biodiversity to adapt to climate change.
- **Target 7.2:** Reduce pollution and its impacts on biodiversity.

Focal Area: Maintain goods and services from biodiversity to support human well-being

Goal 8: Maintain capacity of ecosystems to deliver goods and services and support livelihoods.

- **Target 8.1:** Capacity of ecosystems to deliver goods and services maintained.
- **Target 8.2:** Biological resources that support sustainable livelihoods, local food security and health care, especially of poor people maintained.

Focal Area: Protect traditional knowledge, innovations and practices.

Goal 9: Maintain socio-cultural diversity of indigenous and local communities.

- **Target 9.1:** Protect traditional knowledge, innovations and practices.
- **Target 9.2:** Protect the rights of indigenous and local communities over their traditional knowledge, innovations and practices, including their rights to benefit sharing.

Focal Area: Ensure the fair and equitable sharing of benefits arising out of the use of genetic resources

Goal 10: Ensure the fair and equitable sharing of benefits arising out of the use of genetic resources

- **Target 10.1:** All transfers of genetic resources are in line with the Convention on Biological Diversity, the International Treaty on Plant Genetic Resources for Food and Agriculture, and other applicable agreements.
- **Target 10.2:** Benefits arising from the commercial and other utilisation of genetic resources shared with the countries providing such resources.

Focal Area: Ensure provision of adequate resources

Goal 11: Parties have improved financial, human, scientific, technical and technological capacity to implement the Convention.

- **Target 11.1:** New and additional financial resources are transferred to developing country Parties, to allow for the effective implementation of their commitments under the Convention, in accordance with Article 20.
- **Target 11.2:** Technology is transferred to developing country Parties, to allow for the effective implementation of their commitments under the Convention, in accordance with its Article 20, para graph 4.

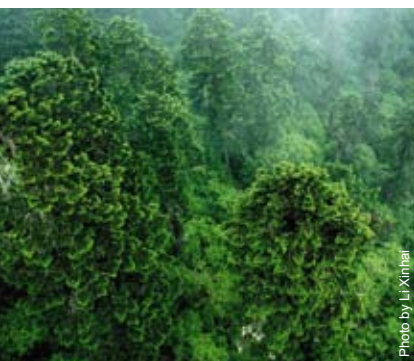


Photo by Li Xinhai

四川西部海螺沟的杉林
Fir forest at Hailuoguo, west Sichuan

概览中国生物多样性保育蓝图

Putting biodiversity on the map – an overview of the China Biodiversity Conservation Blueprint Project

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这个评估过程
是研发资讯、
设定目标及
建立合作夥伴
关系以建构及
执行区域性保育
愿景的有效机制

在《生物多样性公约》之2010年承诺的首个任务是促进生态系统、生境及生物群落的生物多样性保育工作，两个要达成的目标是：(1.1) 令全球各个生态区域里，至少有10%的面积得到有效的保育；及(1.2) 保护对生物多样性有特别重要性的地方。中国已关注到确保在多个省份里，有10%的土地面积受法律保护，并对具生物多样性重要价值的地方予以最大保护。要界定生态区域和具特别重要性的地方，以确保其生物多样性具充足的代表性，方法很多，然而实际挑战亦不少。现时，经济价值往往凌驾于保护生态系统及可持续管理之上。要进行有效的保育工作，尤其是实践2010年的承诺，便需要就保育项目的优先次序定出共同愿景，这须根据专家共同审核的科学方法；善用已知最佳的资讯；以及一套可容易整合生物多样性资料于审核社会经济成本和效益的资讯系统，其中包括评估生态服务及其绘图。

中国生物多样性保育蓝图计划(见图一)便是为建构这个共同愿景而生。这个项目通过对生物多样性的分布情形及状况进行区域性评估，从而研发资讯以助政府机构作出发展决定。大自然保护协会联同合作夥伴，包括中国科学院、国家环境保护总局等政府机构以及非政府组织的保育机构，例如保护国际、国际野生生物保护学会及世界自然基金会，正利用在美国及云南西北部发展出来的生态区评估方法，于长江上游盆地进行淡水及陆上生物多样性评估。研发这些方法的目的是要利用现有的资讯及知识，有系统地建构愿景，并从辽阔的地理环境中定出保育的优先次序。这个评估过程是研发资讯、设定目标及建立合作夥伴关系以建构及执行区域性保育愿景的有效机制^{1, 2}。

用生态区作为规划保育地区性生物多样性的单位，这方法在全球各地已用上超过十年。这是根据塑造出生物多样性模式的主导环境因素，将陆地、淡水域和海洋划分为具生态意义的生物物理单位²。在中国，世界自然基金已划出陆地和淡水生态区。在所划出的陆地生态区，世界自然基金以由中国植被图制作委员会³、长春地理研究所和中国科学院所研发的系统为基础，根据历史和天然情况，显示出独特的生物区分布情形^{4, 5}。

评估长江上游盆地属先导研究计划，将规划生态区的方法应用到这大片地理环境中，目的是要改良技术方法和提高能力，研发出一个适用于全中国而又可在区域性保育规划过程被重复使用的模型。挑选长江上游盆地进行先导计划是因为这里的生物多样性具全球重要性，而由国家环境保护总局主导，联合国环境规划署全球环境基金(UNEP/GEF)资助的项目将会辨识及立法保护具生态功能的保育地方，它们能提供缓和及水灾、控制水土流失、储存碳及生物多样性保育等的生态服务⁶。长江上游盆地生态区评估项目将面对以下的挑战：

1. 在有限的时间及数据下，将生态区规划的做法应用于广阔、具区域性规模的大型河流盆地；
2. 统合规划过程、结果和源数据为一个功能性的支援系统，以助机构作出决定，并改善其在规划及管理时，处理和使用生物多样性资讯的能力；
3. 将生态系统的功能入保育规划和管理中；
4. 将气候变化预测的不同情况纳入保育规划和管理中。



Photo by Li Baomin

青海长江源
Headwaters of the
Yangtze in Qinghai

The first goal under the CBD 2010 commitment is to protect the components of biodiversity by promoting the conservation of the biological diversity of ecosystems, habitats and biomes. The two targets for achieving this are: (1.1) At least 10% of each of the world's ecological regions effectively conserved; and (1.2) Areas of particular importance to biodiversity protected. China has devoted attention to ensuring 10% of its land area is under legal protection in many provinces, and to giving highest protection to areas of recognised biodiversity importance. There are a variety of approaches and practical challenges to defining both ecological regions and important areas in a way that ensures adequate representation of biodiversity. Meanwhile implementing the protection and sustainable management of ecosystems can be compromised by competing economic values. Effective conservation, and meeting the 2010 commitment in particular, requires a unifying vision of conservation priorities based on a peer-reviewed, scientific methodology, on the best available information and on an information system that allows easy integration of biodiversity information into other assessments of socio-economic cost and benefits, including the evaluation and mapping of ecosystem services.

The China Biodiversity Conservation Blueprint Project (see Map 1) was conceived to support the design of this unifying vision. Through regional assessments of biodiversity distribution and status, the project is developing information to support development decisions by several agencies and levels of government. In partnership with the Chinese Academy of Sciences (CAS), government agencies including the State Environmental Protection Administration (SEPA) and conservation NGOs including Conservation International, the Wildlife Conservation Society and WWF, the Nature Conservancy (TNC) is conducting an assessment of freshwater and terrestrial biodiversity in the Upper Yangtze River Basin (UYRB) using ecoregional assessment methods developed in the Americas and in Northwest Yunnan. These methods were developed to provide a systematic approach to define a vision for success and to identify conservation priorities across broad geographic areas that makes best use of available information and knowledge. This assessment process is an effective mechanism to develop information, set objectives and build the partnerships necessary to define and implement a regional conservation vision^{1,2}.

Ecoregions have been used as regional biodiversity conservation planning units globally for over a decade.

They are defined and mapped using a variety of approaches that partition terrestrial, freshwater and marine realms into ecologically meaningful biophysical units based on dominant environmental factors that shape biodiversity patterns². In China, terrestrial and freshwater ecoregions have been delineated by WWF. The WWF terrestrial ecoregions of China emphasize the distribution of distinct biotas based on historic, natural conditions, adapted from the systems developed by the Chinese Vegetation Map Compilation Committee³ and the Changchun Institute of Geography and Chinese Academy of Sciences^{4,5}.

The Upper Yangtze River Basin (UYRB) assessment is a pilot study that will adapt ecoregional planning practices to this large geography, in order to adapt technical approaches and build capacity to produce a replicable model of a regional conservation planning process that can be applied throughout China. This area was chosen for the pilot study because it is rich in globally-significant biodiversity and the focus of a SEPA-led, United Nations Environment Programme/Global Environment Fund (UNEP/GEF) funded project that will identify and legislate protection of Ecosystem Function Conservation Areas (EFCAs) that provide ecosystem services in the form of flood mitigation, erosion control, carbon storage and biodiversity conservation⁶. The UYRB ecoregional assessment will explore the options and challenges presented, by:

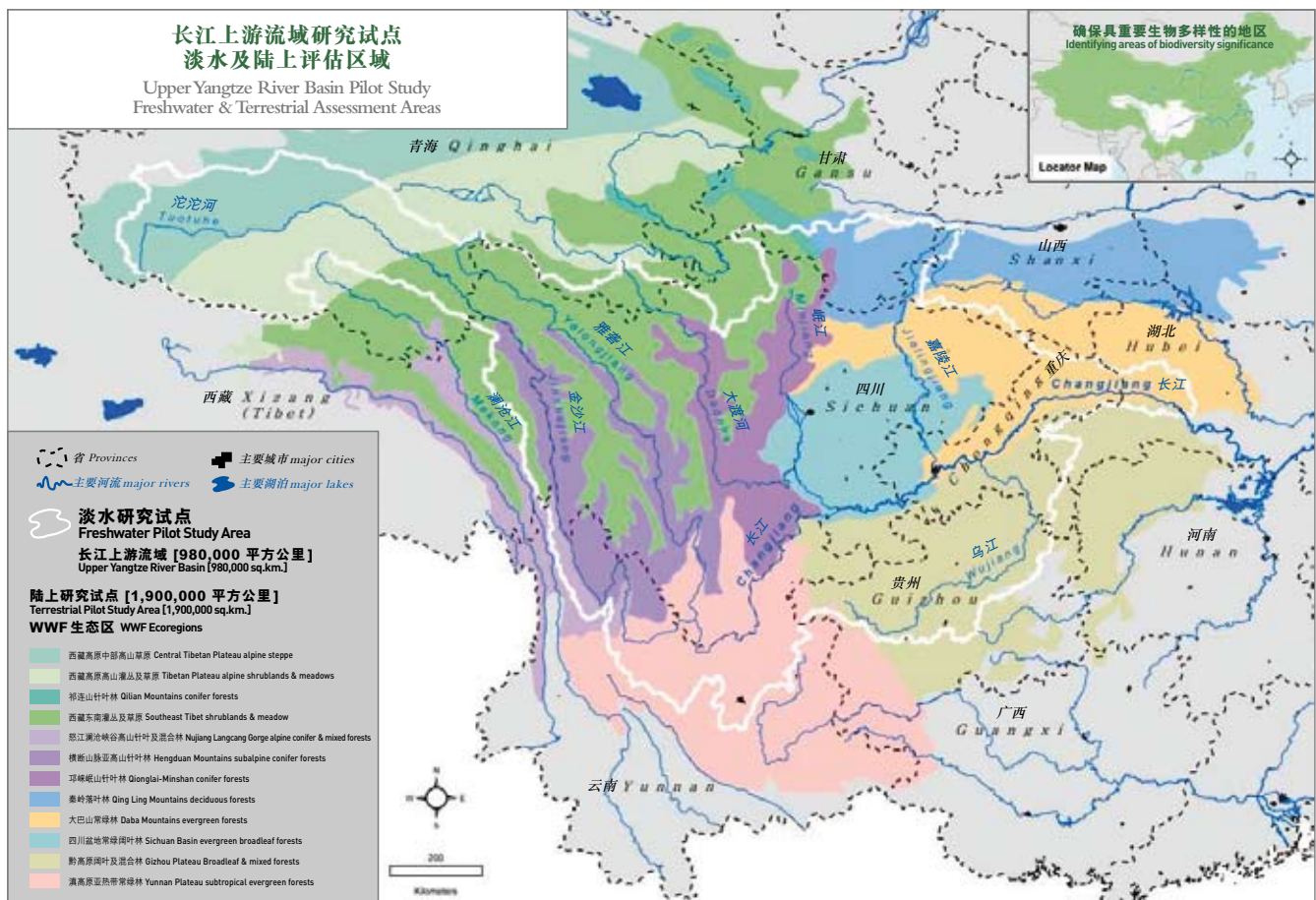
1. adapting ecoregional planning practices to function at the broad, regional scale of a large river basin, given the familiar constraints of limited time and data;
2. packaging the planning process, results and source data in a functional decision-making support system that will improve the capacity of agencies to manage and use biodiversity information in their planning and management;
3. incorporating ecosystem functions into conservation planning and management; and
4. incorporating climate change scenarios into conservation planning and management.

Identifying areas of biodiversity significance

To systematically define a conservation vision, an ecoregional assessment must: (1) define the set of biodiversity elements – typically ecosystems and species –

This assessment process is an effective mechanism to develop information, set objectives and build the partnerships necessary to define and implement a regional conservation vision

图1. 中国保育蓝图计划 Map 1 China Conservation Blueprint Project



确定具有重要生物多样性的地区

要有系统地建构保育愿景，生态区评估必须：

- (1) 界定研究地方的生物多样性特质，即其生态系统及物种元素；
- (2) 就生物多样性元素而言，为种群数量和物种分布范围、生态系统界限、跨越多个主要的环境梯度及地理结构的分布情形，定出明确的保育目标以确保它们能长期保留；
- (3) 根据物种的生存能力和生态系统的完整性，制定等级，以尽量完善生态系统的状况；
- (4) 进行分析，以确定具有重要生物多样性的地方，从而达致目标及改善效率和状况；
- (5) 搜集专家意见，修订及增补一组优先保育的地方，而取得的成果称之为具生物多样性意义的“组合”，这代表著成功保育的愿景。这个概念与财务投资组合相若：根据能获得的最佳资讯设计组合，并根据新的资讯定期作出更新。

理想的做法是将全部生物多样性的元素和生态过程都包括在保育规划内，然而数据有限，亦不能在一个规划过程中，处理所有物种和环境模式的资讯。进行区域性规划时，粗滤法与幼滤法都会用上以广泛代表生物的多样性。这包括全部生态系统（粗滤法）和在生态系统中没有被充份代表的天然生物群落和物种（细滤法），例如稀有、濒危、分布窄或迁移性的物

种^{2, 7}。粗滤法的假设是，保育具代表性的生态系统便能同时保护众多普遍的物种和群落，以及不知名或采样不足的物种，还有让它们演化的环境⁸。使用这方法令保育的对象超越物种，达致保护生境和生态系统⁹。如果只聚焦于物种，便不足以保育它们；因为我们对它们所栖息的环境认识不够，而在物种的采样数据中我亦无法得知它们赖以生存的宏观环境情况。再者，粗滤法生态模式还可将气候变化的预测资讯也纳入其中。

淡水生态区评估：长江上游盆地

长江上游淡水评估的分析架构是源自世界自然基金会水文学的河流网络和分水岭结构¹⁰。利用这个分析架构，我们遵照 Higgins 等⁹所研发的方法，依据盆地大小、季节性气候模式¹¹、盆地形态、地质及水文，发展出一套生态系统分类法。我们已选出一组盆地作为初步优先保育的地区，取决条件是：(a) 由专家指定特有鱼类聚居地的焦点地方，而这些聚居地的状况需为良好的，并辅以 (b) 以 MARXAN 软件¹²自动选出的地点，使之具生态系统的代表性，并将连通性和生态状况完善化。这评估项目将于 2008 年进一步延伸至整个长江流域，并会结合全球受威胁（= 极危、濒危或易危）的鱼类¹³和本地水生植物的分布数据。



Photo by James Hardcastle

青海藏区的湿地草原
Tibetan wetland
grassland, Qinghai.

that are characteristic of the biodiversity of the study area; (2) for those biodiversity elements, set explicit conservation goals for the number of populations, species range, ecosystem extent, distribution across major environmental gradients and geographic configuration – necessary to persist over time; (3) rank occurrences of ecosystem and species by viability and ecological integrity, in order to optimize for ecological condition; (4) conduct analysis to identify areas of biodiversity significance that collectively meet goals and optimize for efficiency and condition; and (5) collect expert input to revise and append that set of priority areas based on expert knowledge. The result is referred to a “portfolio” of areas of biodiversity significance, which collectively represent a comprehensive vision for conservation success. This is similar in concept to a financial investment portfolio designed based on best available information and regularly updated as more information becomes available.

Ideally, all biodiversity elements and ecological processes should be included in conservation planning, but data are limited and it is not possible to manage information on all species and environmental patterns in a planning process. The coarse- and fine-filter approach is used to comprehensively represent the biodiversity in regional planning. It includes all ecosystem types (coarse filter) and a sub-set (fine filter) of natural communities and species which will not be well represented by ecosystems, such as those that are rare, endangered, restricted, or migratory^{7,2}. The coarse-filter premise is that conserving representative ecosystems protects many common species and communities, species that are unknown or poorly sampled, and the environments in which they evolve⁸. Implementing this approach allows us to advance conservation beyond species to protect habitats and ecosystems⁹. A sole focus on species is not adequate to conserve them; there is inadequate understanding of the environmental matrix in which they live, and the broad-scale processes needed to maintain them are not represented by species sampling data. Additionally, where information exists, coarse-filter ecosystem models can incorporate climate-change projections.

Freshwater Ecoregional Assessment: Upper Yangtze River Basin

The analysis framework for the UYRB freshwater assessment is a stream network and watershed hierarchy derived from WWF HydroSHEDs hydrology¹⁰. With

this analysis framework, we have developed an ecosystem classification based on basin size, seasonal climate patterns¹¹, basin morphology, geology, and hydrology, following methods developed by Higgins *et al.*⁹. We have identified a set of basins as preliminary conservation priority areas based on (a) expert-designated focal areas known to support endemic fish assemblages that are in good condition, supplemented by (b) automated site selection using MARXAN software¹² to meet representation goals for ecosystems and optimize for connectivity and ecological condition. During 2008, we will extend this assessment to include the entire Yangtze River and incorporate data representing distribution of globally Threatened (=Critically Endangered, Endangered or Vulnerable) fishes¹³ and native aquatic plants.

Terrestrial Ecoregional Assessment: Upper Yangtze Forests and Steppe

The terrestrial study area covers the 12 WWF terrestrial ecoregions that span the UYRB, an area of almost 2 million km² reaching from the Himalayan Alpine Steppe to the Yunnan Subtropical Forests. The terrestrial biodiversity elements include (a) terrestrial ecosystems modelled with available GIS data and (b) globally Threatened native species¹³. We are developing a portfolio of priority conservation areas that includes the existing national Protected Areas system and will meet representation goals for ecosystems (set at 30% of estimated historical ranges) and species (set by taxonomic group, based on ranges and spatial habitat patterns). This portfolio design is based on a combination of data-driven site selection with MARXAN software¹² and expert input.

A current, national mapped ecosystem classification does not exist in China. As a long term solution, the Institute of Botany is collaborating with NatureServe¹⁴ to develop a national classification and map based on a protocol developed by the Global Earth Observation System of Systems (GEOSS)¹⁵. As a short term solution, for the purpose of this assessment, we developed a GIS model to represent characteristic vegetation types and environmental settings for the UYRB terrestrial study area based on climate zones (Koppen-Trewartha ecological zones)¹¹, phytogeography (WWF terrestrial ecoregions)⁴, vegetation structure (land cover), landforms and surficial geology. We have also incorporated climate change scenarios into the coarse-filter ecosystem model to evaluate potential impacts on ecosystems and portfolio design, and to design

陆上生态区评估： 长江上游森林和大草原

陆上的研究面积涵盖世界自然基金所规划的12个陆上生态区，覆盖面积几近二百万平方公里的长江上游盆地，范围所及由喜马拉雅山脉大草原至云南亚热带森林。陆上生物多样性的元素包括(a)结合地理信息系统数据的陆上生态区及(b)全球受威胁的本土物种¹³。我们现正发展一套优先保育地方的组合，包括现存的全国保护区系统，并会达致生态系统(设定为估计历史范围的三成)和物种(根据分布和空间生境模式，设定分类组别)有关代表性的目标。这个组合的设计结合了由MARXAN软件¹²根据数据选出的地点和专家的意见。

现时中国并没有通用的全国性生态系统分类，长远解决方法是由植物研究所与NatureServe¹⁴根据全球综合地球观测系统¹⁵规则进行全国性的分类及制作有关地图。为进行是项评估工作，我们采纳的短期解决方法是以气候地带(Koppen-Trewartha生态地带)¹¹、植物地理(世界自然基金陆地生态区)⁴、植被结构(土地覆盖)、地形及地面地质为基础所研制出来的地理信息系统模型，以代表长江上游盆地陆上研究地方上的独特植被类型及环境设定。我们亦将气候变化预测的不同情况融入粗筛法生态系统模型中，以评估对生态系统和组合设计可能带来的影响，并设计出能应付即时及预测气候设定的组合。

此外，在受威胁物种方面，我们通过与具领导地位的研究员合作，编制了一个物种观察记录的资料库，其中包括世界自然保护联盟所列出的366种受危的哺乳类动物、雀鸟、爬虫类动物、两栖类动物，以及植物。

生态系统服务

为支持由国家环境保护总局主导的长江上游生态系统功能及缓减泛滥的研究⁶，国家环境保护总局及成都山地灾害与环境研究所合作研发地理信息系统模型，制作地图，测量缓和泛滥、控制侵蚀及碳储存的情况。长江上游生物多样性的评估将有助是次有关生物多样性组成部份的研究。我们亦将分析有重要生态系统功能的保育地区与生物多样性的关系，目的是进一步掌握将生态系统功能加进管理决定的策略性根据及得失，这些决定都关系到保育生物多样性和人类的社区。

长江上游生态评估现正通过举行工作坊及访问，由专家进行审核，目的是根据补充的资料及专家知识，修订和增补陆地及淡水保育区的组合，并将于今年6月发表公开报告，论述有关结果及方法。

全国蓝图项目的下一个阶段将集中与国家级及省级的夥伴分享方法和数据管理系统，以提高他们对保育中国生态区之愿景的设计和执行力。范围包括在中国西部、内蒙古大草原及将由中国生物多样性行动计划选出的地区(现正进行有关修订工作)。

蓝图项目现正通过进行区域性评估，为长期保育长江上游陆上及淡水的生物多样性建构愿景。这些资讯直接有助达致《生物多样性公约》2010首项承诺的两个目标：根据本土物种分布和生态系统，定出具代表性的生态地区及重要地方；以及量度迈向这2010目标的进程。也许，最重要的是，这些资讯将有助陆上和淡水资源的可持续管理，并可为社会经济带来效益。

我们欢迎提问和建议，有兴趣参与专家评审、研发数据及生态区未来评估工作的人士及团体，请发电邮至大自然保护协会(赵鹏, pzhao@naturechina.org)。



青海藏野驴
Tibetan Wild Ass in Qinghai

Photo by James Hardcastle

下一个阶段将
集中与国家级
及省级的政府夥伴
分享方法和数据
管理系统

portfolios that accommodate both current and forecasted climatic settings.

To represent threatened species, we compiled a database of species observations, through a series of contracts with leading researchers, that includes 366 IUCN-listed Threatened mammal, bird, reptile, amphibian and plant species.

Ecosystem services

To support the SEPA-led study of ecosystem functions and flood mitigation in the Upper Yangtze⁶, SEPA and the Chengdu Institute of Mountain Hazards and Environment have developed GIS models to map and measure flood mitigation, erosion control and carbon storage across the UYRB. The UYRB biodiversity assessment will contribute to the biodiversity component of this study. We will also analyse the relationship between areas of importance for conservation of ecosystem functions and biodiversity, in order to better understand the tradeoffs and strategic basis for including ecosystem functions to influence management decisions that conserve both biodiversity and human communities.

The Upper Yangtze Assessment is now in expert review, through workshops and interviews, in order to append and revise terrestrial and freshwater conservation area portfolios based on additional information and expert knowledge. A public report describing the results and methods will be published in June 2008.

The next phase of the national Blueprint Project will focus on sharing methods and data management systems with government partners at the national and provincial levels, in order to build capacity to design and implement ecoregional conservation visions across China. This will cover ecoregions in western China, the grasslands of Inner Mongolia and areas identified by the next China National Biodiversity Action Plan, which is currently under revision.

Through this regional assessment, the Blueprint Project is defining a vision for the long-term conservation of terrestrial and freshwater biodiversity in the UYRB. This information can directly inform decisions that work towards achieving the two targets of the first CBD 2010 commitment – defining ecological regions and important areas by representing the range of native species and ecosystems – and supporting measures of progress towards that 2010 goal. Perhaps most importantly, this information will support the sustainable management of terrestrial and freshwater resources and have socioeconomic benefits in the future.

Questions and input are welcome and appreciated. Individuals and organizations that wish to contribute to expert review, data development and future ecoregional assessments are asked to contact TNC by email (Zhao Peng, pzhao@naturechina.org). 

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*The next phase
of the national
Blueprint
Project will
focus on sharing
methods and
data management
systems with
government
partners at the
national and
provincial levels*



很多蛙类都被捕捉作为食用或贸易
Many frogs are collected for food or for trade.

红色名录，红色名录指数 和华南地区的两栖类

The Red List, the Red List Index and South China's Amphibians

刘惠宁 by Michael Lau, mwnlau@kfbg.org

生物多样性公约采纳了一个雄心勃勃的目标——将当前的生物多样性消失率在2010年或以前显著降低。但因地球上的生物实在极之繁多与复杂，根本没有一个既简单又可靠的方法来量度生物多样性消失的速度。尽管众多分类学家多年来投入大量精力，我们仍未能准确地估计世界上有多少物种存在，科技的进步——如分子分类学——提供了非常有用的工具，但亦显示出我们对生物多样性及进化的了解实在非常有限。我们对大部份物种的现状，如数量、分布、和它们的趋势，亦是不清楚，如要找出这些资料，将需要投入大量人力、物力与时间。世界自然保护联盟(IUCN)红色名录濒危等级与标准正提供了一个既明确又客观的系统用绝灭风险来把物种评级，这一系统能被不同人贯彻地来评估不同的动植物。如果能每隔一段时间做一次这样的红色名录评估，物种平均受危等级的改变便可用来监察绝灭风险和生物多样性消失的趋势。至今鸟类已被完全评估四次而两栖类则为一次，到2010年这两类群会被再评估多一次，而兽类、爬虫类、淡水鱼、鲨鱼和鳐、淡水贝类和很多植物类群亦会被完全评估一次。由红色名录研发出的红色名录指数^{1,2} (RLI) 可表明一个类群的整体受危情况的改变

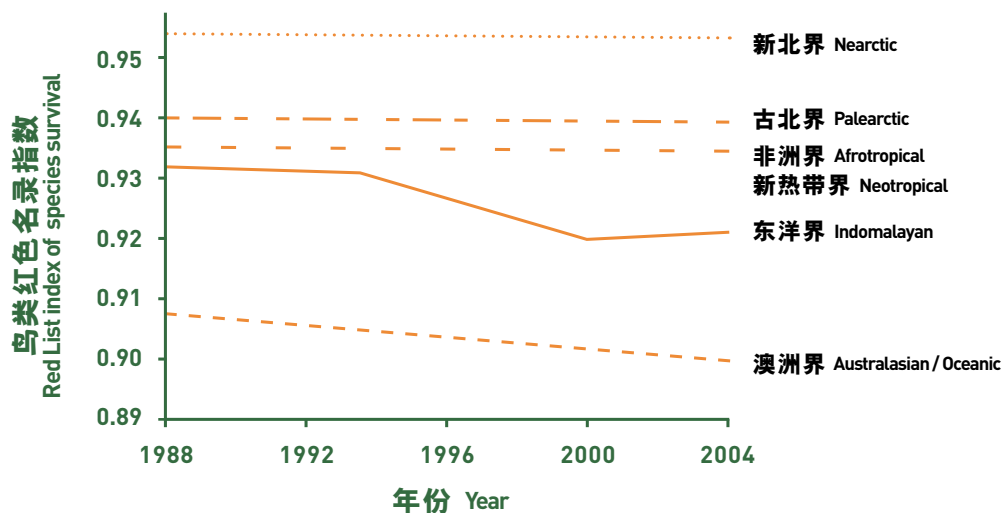
速度，而亦被用来追踪迈向2010年目标的进展。

最理想的是能把所有分类类群的红色名录指数计算出来，以便我们能掌握生物多样性的全球性趋势，可是对一些研究不多或有极多种的类群如真菌和昆虫，这是不可能的。一个透过随机取样或选取具代表性样本的取样红色名录指数(SRLI)亦因应而生³，而这些被选中的物种会被定期评估。这个透过取样的方法能将更广泛的物种加进量度生物多样性改变的机制内，使其在地理上、分类上及威胁程度上更具代表性。

两栖类物种繁多，有超过5,700种。除了南极洲以外在全球的各大洲的众多不同生境里都可找到它们。在食物网中，两栖类担当重要的联系角色，捕食细小无脊椎动物亦可成为蛇、鸟等的食物；当蝌蚪变为蛙时，亦将有机物质从水生生境带到陆地。两栖类的生活史包括陆生阶段及水生阶段，皮肤具渗透性，有毒或有害的物质能轻易进入体内，它们的卵亦没有硬壳所保护，所以它们对环境改变特别敏感，是甚适合作为环境健康的指示类群。当环境退化时，它们通常都是首先被发现减少的。

图一. 不同生物地理区内的鸟类红色名录指数(RLI)，经修订后的计算：指数等于1.0代表所有物种都被界定为无危(不受威胁)。图表显示出热带亚洲(东洋界)的鸟类呈最大幅度的下降。

Figure 1. Red List Index for birds in different biogeographic realms, under the revised formulation;² an RLI value of 1.0 equates to all species being categorised as Least Concern (not threatened). Tropical Asian birds show the steepest declines in status. Reprinted from Butchart *et al.* 2007 with kind permission of the first author.





鹦哥岭树蛙 — 最近才在海南鹦哥岭自然保护区发现的新种
Rhacophorus yinggelingensis
— a recently discovered tree frog from Yinggeling Nature Reserve, Hainan

The Convention on Biological Diversity adopted an ambitious target to significantly reduce the current rate of biodiversity loss by 2010. However, there is no simple yet reliable way to measure rate of biodiversity loss throughout the world because Earth's biota is extremely diverse and complex. Despite many years of dedicated work by taxonomists on different groups, we still cannot give an accurate estimate of how many species there are in the world. Advances in technology, like the use of molecular data, provide powerful tools but they also show that our understanding of biodiversity and evolution remains very limited. Similarly, the status of most species, as reflected by population size, distribution and trends, is not known and would require tremendous effort and time to find out. The IUCN Red List Categories and Criteria provide an explicit, objective system for classifying species according to their extinction risk, which can be applied consistently by different people over different animal and plant groups. By conducting conservation assessments at intervals, changes in the average threat status of species can be used to monitor trends in extinction risk and biodiversity loss. So far, birds have been completely assessed four times and amphibians once. By 2010 these two groups will have been re-assessed once more while mammals, reptiles, freshwater fish, sharks, rays and chimeras, freshwater molluscs and many plant groups will have been completely assessed once. The Red List Index (RLI) has been developed based on the Red List^{1,2} to illustrate the rate of change in overall threat status in a particular group, and is being used to track progress towards the 2010 Target.

Ideally RLI would be applied to all taxonomic groups in order to gain an insight into the global trends of biodiversity but this is not possible for less well-studied and/or diverse groups such as fungi and insects. A sampled RLI (SRLI) has been developed in which a random or representative sample of species from major taxonomic groups is selected and these will be assessed at regular intervals.³ This sampled approach will allow a greater range of species to be incorporated in the measurement of changing biodiversity so that it is more representative geographically, taxonomically and by threat level.

Amphibians are a diverse group with over 5,700 species occurring in many different habitats across all continents except Antarctica. They form important links in food webs and in the movement of organic matter from the aquatic to the terrestrial environment, when tadpoles metamorphose

into young adults. Amphibians are good indicators of environmental health because of their biphasic life cycle, permeable skin and unshelled eggs, each of which makes them especially susceptible to environmental change. They are often the first group of animals to decline noticeably when the environment is degraded.

The IUCN Global Amphibian Assessment was completed in 2004. Every known amphibian species (5,743 species altogether) in the world was evaluated using the IUCN Red List criteria.⁴ The findings were worrying. At least nine species had gone extinct since 1980, 32% were threatened with extinction and 43% of all species had suffered population decline,⁵ showing that amphibians are in more trouble than other vertebrate groups. A preliminary RLI was carried out for the amphibians and the index value had decreased by 13.7% during the period from 1980 to 2004, equivalent to approximately 30% of the species in each category, from Near Threatened to Critically Endangered, being up-listed by one category.³

An analysis of amphibians in China by Xie *et al.* (2007) showed that 100 species are extinct or threatened and 23 species are projected to have deteriorated in their Red List category since 1980,⁶ i.e. they have declined rapidly. The South China (i.e. Guangdong, Guangxi, Hainan and Hong Kong SAR) amphibian fauna has a threatened percentage (25%) similar to the national total (27.3%) and there are one Critically Endangered, eight Endangered and 16 Vulnerable species (see Table 1). The vast majority of the threatened South China amphibians are associated with forests and/or streams, making them especially susceptible to habitat loss and degradation caused mainly by deforestation in the past. The construction of hydro-dams poses a more recent and additional threat to the stream species. Chinese Giant Salamander *Andrias davidianus* and the spiny frogs belonging to the genus *Paa* are collected for the commercial food trade, making over-exploitation their main threat. These commercially valuable amphibians are the only South China species identified by Xie *et al.* to have declined rapidly since 1980.⁶

Although much has been learnt about the amphibians from the Red List Assessment and the RLI analysis, there are still some obvious gaps. Amphibians have been completely assessed only once, in 2004, and the RLI analysis is only preliminary as the 1980 Red List categories had to be retrospectively assigned by considering the 2004 criteria and information on the threats. In order to gain

表一. 不同红色名录等级内的中国两栖动物物种数目

Table 1: The number of Chinese amphibian species in the IUCN Red List Categories

红色名录濒危等级 Red List Category	中国* China*	华南地区 South China
绝灭 Extinct	1	-
极危 Critically Endangered	8	1
濒危 Endangered	39	8
易危 Vulnerable	52	16
近危 Near Threatened	35	9
无危 Least Concern	166	61
数据缺乏 Data Deficient	65	5
总数 Total	366	100
受威胁或绝灭的百分比 % threatened or extinct	27.3%	25%

Xie et al., 2007*^{*}

这新一轮评估的
准确性取决于能否
掌握最新的
分布、数量、
趋势及威胁的资料

世界自然保护联盟全球两栖类评估在2004年完成，每一已知的两栖动物(共5,743种)都根据红色名录的标准来被评估⁴。结果令人担心，至少有九种已自1980年以来绝灭，32%受绝灭威胁，而43%的种群数量呈现下降⁵，显示出两栖类的处境比其他的脊椎动物更糟。初步计算出来的红色名录指数则指出从1980年到2004年这个指数下跌了13.7%，相当于有近百分之三十在近危至极危的两栖类在这期间其受危等级上升了一级³。


谢峰等(2007)对中国两栖类的分析显示有100种已绝灭或受威胁，而有23种被推断为自1980年至今其红色名录濒危等级有所恶化⁶，亦即它们的数量迅速下降。华南(包括广东、广西、海南及香港)两栖动物的受危比率(25%)与全国的比率相若(27.3%)，有一个极危、八个濒危及16个易危种(见表一)。绝大部分在华南受威胁的两栖类都栖息在森林或溪流，它们特别容易受从前毁林所引致的生境破坏影响，而近年水电站的兴建则构成对溪流两栖类的额外威胁。大鲵*Andrias davidianus*及棘蛙属的很多种*Paa* spp. 却因商业贸易而被过度捕捉，在华南亦只有这些具商业价值的两栖动物是自1980年急速下降的⁶。

虽然我们从两栖类红色名录评估及红色名录指数分析中得知不少，但仍有一些不足之处。两栖类只在2004年被彻底地评估过一次，其红色名录指数分析乃是初步的，因各物种在1980年的红色名录等级需从2004年的标准及威胁资料推断出来。如要准确得出两栖类状况的改变，以测定对2010年将生物多样性消失率显著降低的目标的进展，我们便需对两栖类重新评估，而世界自然保护联盟物种生存委员会(SSC)的两栖类专家组正在统筹这项工作。这新一轮评估的准确性取决于能否掌握最新的分布、数量、趋势及威胁的资料。若要开展一个包含所有两栖类物种的全国性或地区性的调查可能太过费劲，但其实自2004年的评估以

来，各地的科研人员、老师、学生和自然学家已搜集了很多这方面的资料，这些数据应予发表，使它们能被用于新一轮的红色名录评估，特别是关于那些数据缺乏的种。

我们亦要关注不明所以的两栖类种群下降甚至消失。这种两栖动物“突然”消失于完整生境之现象在中南美洲及澳洲出现得特别多，但从未在亚洲报导过。科学家需时超过10年才弄清很多这些消失是和一种由chytrid真菌所引起的病相关。一些两栖类已因这种病而绝灭，但另外一些种却好像不受这种真菌影响而成为带菌者。直至近期，一些在亚洲的小型研究(如Rowley等, 2007⁷)并没有发现这种真菌，但在2007年8月第三届亚洲兽医病理学会和亚洲兽医学院的联合会议上，Y. Une医生报告已在日本的野生两栖类身上发现这种真菌。看来亚洲是不能避过这种病菌，而它对本区两栖类的影响仍是未知之数。如「森林脉搏」的读者知道一些不可解释的两栖类数量下降或在野外目睹大量死去的两栖类，请与本文作者联络。

气候变化乃另一越来越对两栖类及其他生物构成威胁的全球性现象。普遍预料华南地区的温度、不论夏季或冬季、都会上升，而极端的天气则会更频繁，这将对区内两栖类动物造成甚么影响仍是不大清晰，但预期高海拔地区的两栖类所受的风险更大，因其所适应的小气候及小生境将会随温度上升而逐渐向山上退。在欧洲，气候变化令一些主要生境的温度变得特别适合chytrid真菌，引致一些蛙及鲵的种群崩溃⁸。高海拔地区两栖类群落的改变是很值得我们留意的。

两栖类和其他类群一样，利用红色名录指数来显示生物多样性的趋势将依赖从野外搜集回来的优质资料，保护区工作人员、科研人员及自然学家可为更了解它们的分布、生态、趋势及威胁担当一个角色，而展望将物种引离绝灭边缘则取决于能否明白这些威胁并对症下药。

被列为极危的大鲵，主要威胁来自滥捕
Chinese Giant Salamander — a Critically
Endangered species threatened by over-
exploitation





小水电站为在溪流生活的两栖类带来新的威胁
Small hydro-dams constitute new threats to stream-dwelling amphibians

a more accurate picture of the change in their status, and thus determine progress with respect to the 2010 Target of significantly reducing the rate of biodiversity loss, the amphibians need to be re-assessed and this is now being carried out by the IUCN SSC Amphibian Specialist Group. The accuracy of this new assessment depends on the availability of up-to-date distribution, population, trends and threats information. It is probably too ambitious to launch a nation- or region-wide survey to gather data for all the species but in fact a lot of information has been gathered by researchers, teachers, students and naturalists since the last assessment. These data should be published so that they will become available and can be used in the assessment process. In particular, information for the Data Deficient species are needed so they can be properly assessed.

Attention should also be paid to 'unexplained' declines or disappearances of amphibian populations. The phenomenon of amphibians that have 'suddenly' disappeared from places where the habitats remain intact has occurred particularly in South and Central Americas and Australia, but is not reported in Asia. It took scientists more than ten years to figure out that a lot of these declines are linked to chytridiomycosis, a disease caused by the chytrid fungus. Some amphibians have become extinct because of this disease while others are merely carriers and are apparently not affected by the fungus. Up until recently, the very few, small-scale studies in Asia (e.g. Rowley et al., 2007⁷) did not find this fungus. However, during the Joint Meeting of the 3rd Meeting of Asian Society of Veterinary Pathology & the Association of Asian Veterinary Schools in August 2007, Dr Y. Une reported finding the chytrid fungus in wild amphibians in Japan. So it seems Asia is not immune to this pathogen and its impact on native amphibians is yet to be seen. If readers of *Living Forests* have observed 'unexplained' declines of amphibians or found large numbers of dead amphibians in the field, they are requested to kindly contact the author.

Another global phenomenon that is likely to have increasing impact on the amphibians and other biota is climate change. The generally agreed prediction for South China is that the temperature will increase in both summer and winter and there will be more extreme weather events. The implications for the regional amphibians are not clear but it is expected that the high-altitude species will be more at risk as their preferred micro-climate and habitat

will recede up the mountains as it gets hotter. In Europe climate change has also been found to tip key habitats into optimal temperature conditions for chytrids, precipitating frog and salamander population collapses.⁸ Changes in the distribution and communities of amphibians in high altitude areas are something worth looking into.

For amphibians, as for other groups, the effectiveness of the Red List Index in indicating biodiversity trends will depend on the quality of information from the field – there is a place for reserve staff, academics and naturalists in understanding distribution, ecology, trends and threats. The prospects for steering species from extinction depend on understanding and countering these threats. (林)

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The accuracy of this new assessment depends on the availability of up-to-date distribution, population, trends and threats information



《生物多样性公约》2010：我们在华南走对了路吗？

CBD 2010: Are we on track in South China?

费乐思 (谨向Richard Corlett、Charlotte Hicks 和刘惠宁致谢)

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(With thanks to Richard Corlett, Charlotte Hicks and Michael Lau)

南中国是全球
新保护区投资
项目中的最优先
地区之一

于《生物多样性公约》(CBD)的理想目的是在2010年¹显著减低生物多样性消失的速度，为此而需要思考如何量度有关消失及减低消失所需要采取的行动。大部份保育专家及CBD成员都很清楚，面对快速经济发展及人口增长，要减低物种消失速度并不可能一蹴而至。首先，要界定原本的消失速度也不容易。生物多样性是个不易理解的复杂概念，涵盖面很多——而生态系统和物种一下子消失属极端情况。故此，要将这个概念转化为一系实质、可量度的目标实在是一大挑战。不过，CBD成员最终还是界定并同意了这些目标(参看第35-36页)²，它们为达致控制生物多样性消失的目的提供了一个框架。

那么，我们在华南的进展如何呢？有关全国性的正式报告，大家可参看CBD执行方面的最新国家报告³。以下是自千禧年起的非正式进展评估，以2010年目标的精神为基础；至于评分，每项目标最高为十分。这完全属主观评估，故欢迎大家提出意见及讨论！

保护生物多样性的组成部份

在CBD目标中，多项生物多样性组成部份皆被认为需要关注：具代表性的生态区；对生物多样性特别重要的地区；数量正在下降的特选物种；受危物种面临的灭绝危机；「珍贵」物种的基因多样性；以及与这些有用物种相关的本土知识。虽然根据「2001全国性保育野生动植物计划」及「发展自然保护区⁴」两个项目，到了2010年，中国的受保护地区将增至16%，但横跨多个生态区⁵的覆盖面却非常不均。从Google地图(即使是在今年雪灾前)显示出，在华南地区，被天然植物所覆盖的面积远低于10%——而这个目标对于其大部份的生态系统，包括低地湿润常绿森林低湿地、半常绿热带森林及温带针叶林⁶来说已是太迟了。近年受法例保护的地区已增加，例如鹦哥岭的自然保护区面积有500平方公里，保护了海南

中部的许多高地森林。然而，海南受保护的面积才7%；广西为6%；广东要到2020年才达10%，而在2010年，只有7%⁷。现时，南中国是全球新保护区投资项目中的最优先地区之一^{8,9}。在保护区内，保育工作的有效性各有参差，一些现存的天然森林受捕猎、砍伐、采集及具破坏性的基建工程所影响^{10,11}；此外，在改善管理时¹²，亦受制于种种制度上的限制；结果哺乳类动物、龟类、蛙类、鱼类及其他物种的数量持续下降。可惜有关政府部门未能通过新的保护区法例；不然或可有助保育工作。另方面，保护区的技术水平已有整体改善，非法使用枪械和设置陷阱在许多地方已受到控制，至少一些适应力较强的物种(如野猪、猴和水鹿)数量正上升；此外，能力提升的行动亦已开展。目前，评估一个地点的生物多样性重要程度的标准并不清晰，似乎偏重于考虑「国家」的因素(例如受国家保护的物种数量)多于全球受危的元素¹³。政府亦明白到需要采用有系统的方法，结合近年所取得的广泛但零散的数据，并必须加入生态学家的意见。通过对一些物种(例如陆上脊椎动物和裸子植物)进行较佳的红色名录评估，从而增进有关灭绝危机的知识，令到一些物种的国家性¹⁴和全球性¹⁵红色名录得以大大改善。而对于其他类别(例如蜻蜓)的评估亦会在2010年前完成，可提供一些基准及实质趋势的资料(参看第37-38页)。例如在中国热带及亚热带森林生物群落中的58种受危物种，当中54种(93%)其全球性数量呈下降趋势¹⁵。我们对于它们所面对的威胁，都较以往所知的多，但野外情况得到改善的例子却寥寥可数。在中国，具经济价值物种的遗传基因多样性比较受重视，但这基因改造商品的蔓延势头仍为遗传多样性带来危机，尽管近期实施的生物安全条例令势头减慢下来。另一方面我们对受干扰的自然生态系统内功能性的组成部份的了解并不全面^{16,17}。总体上不能说生物多样性的所有组成部份都得到保障，但有关工作却肯定正在进步中。评分：22/50



The aspirational aim under the Convention on Biological Diversity (CBD) to significantly reduce the rate of biodiversity loss by 2010¹ was intended to focus thought on how to measure loss, and action on how to reduce it. Most conservationists and CBD Parties were well aware that slowing the loss, in the face of fast economic development and population growth, was not going to be possible so soon. To begin with, even defining the baseline rate of loss was difficult. Biodiversity is a poorly understood concept, in part because it is so complex, incorporating many dimensions – the outright loss of ecosystems and species are extreme cases of decline. Nailing it down to a series of solid, measurable targets was quite a challenge. Eventually, though, the targets were defined and agreed by the Parties (see page 35–36).² Together, they provide a framework for charting progress toward getting biodiversity loss under control.

So how are we doing in South China? For the official report at the national level, the reader is referred to the latest National Report on CBD Implementation.³ The following, unofficial evaluation of progress since the millennium is based on the spirit of the 2010 Target. Scores in each focal area, based on a maximum of 10 points per target, are entirely subjective. Argument is welcome!

Protecting the components of biodiversity

Various “components of biodiversity” are recognised as needing attention in the CBD targets: areas representing ecological regions; areas of particular importance to biodiversity; declining populations of selected taxa; extinction risk of threatened taxa; genetic diversity of “valuable” species; and local knowledge linked to these useful species. While China’s **protected-areas system** is scheduled to expand to 16% of the country by 2010 under the 2001 National Programme of Wildlife Conservation and Nature Reserve Development,⁴ the coverage is very uneven across ecological regions.⁵ A glance at a Google map (even before this year’s snow damage) shows that far less than 10% of South China is covered in natural vegetation – the target came too late for most of its ecosystems, including Lowland Wet Evergreen Forest, Tropical Semi-evergreen Forest and Temperate Coniferous Forest.⁶ For some areas legal protection has increased in recent years, exemplified by the 500 km² nature reserve at Yinggeling protecting much of central Hainan’s upland

forest. Still, Hainan’s coverage is only 7%, and Guangxi’s 6%; in Guangdong it will not be until 2020 that nature reserves cover 10% of the land, and only 7% will be protected by 2010.⁷ Southern China is now one of the highest-priority areas globally for new protected-area investment.^{8,9} Within protected areas **effectiveness of conservation** varies, with some surviving natural forests disturbed by hunting, logging, collecting and harmful infrastructure,^{10,11} with a range of institutional constraints on improved management,¹² such that populations of mammals, turtles, frogs, fishes and other taxa have continued to decline. The responsible Government administrations have been unable to agree on a new protected-areas law, which might have helped. On the other hand there has been overall improvement in technical capacity of reserves, illegal shooting and trapping has been controlled in many areas, and the more resilient species (such as Wild Boar, Rhesus Monkey and Sambar) are increasing locally; additional capacity-building initiatives are under way. To date the criteria for evaluating **biodiversity importance** of sites are unclear, with “national” factors (e.g. number of state-protected species) arguably over-emphasised relative to globally threatened elements.¹³ The Government recognises the need for a systematic approach (see pp. 37–38), integrating the extensive but scattered data from recent years, and this must incorporate ecologists’ insights. Knowledge of **extinction risk** has improved through better Red List assessments of some taxa (e.g. land vertebrates and gymnosperms), allowing greatly improved national¹⁴ and global¹⁵ Red Lists for some taxa. Reviews of other groups (e.g. dragonflies) will be completed before 2010, providing baselines and actual trends in some cases (see also pp. 43–46). As an indication, for 58 threatened species in tropical and subtropical forest biomes of China, a downward global population trend is reported for 54 (93%).¹⁵ For many species threats are better understood than before, but there are few examples of threatened species that have improved their status in the wild. **Genetic diversity** of “economic” species is less neglected in China than that of others, but diversity is still at risk from the spread of genetically modified commercial varieties, albeit slowed by recent biosafety regulations. Meanwhile understanding of the **functional components** within disturbed natural ecosystems is very patchy.^{16,17} In all, the components of biodiversity cannot be said to be at all secure, but progress has certainly been made. **Score: 22/50**

*Southern China
is now one of the
highest-priority
areas for new
protected-area
investment*

大量消费加上
木材与野生动植物的
非法贸易，
中国距离达致
可持续的目标
尚很遥远

一些自然保护区在恢复野生动植物上颇成功，但可能只局限于适应力较强的物种

Wildlife recovery is hailed in some nature reserves but may be limited to resilient species



促进可持续使用生物资源

「可持续使用」的意思是：确保产品来自可持续的来源，而且生产地的管理方法符合保育生物多样性的原则；减低不符合此原则的消费或对生物多样性的影响；并避免通过国际贸易而令野生动植物受危。跟整体富裕国家相若，中国距离达致可持续的目标尚很遥远，大量消费加上木材与野生动植物的非法贸易，使很多物种受危^{18,19,20,21,22,23,24}。**消费者认证**，例如FSC森林认证的渗透速度低，而消费者的道德意识仍落后于大部份发达国家。至于**国民生态足迹**现时仍远低于其他国家，但这方面正出现大的变化²⁵。具体的例子是产于东南亚的棕榈油——其生产对森林有破坏性影响²⁶——而中国是最大的消费国²⁷。本区的地貌呈现**不符合可持续耕作方式及土地使用**所遗下的破坏痕迹，并有泥土侵蚀的情况，植物多样性下降，塑胶垃圾堆积，以及被具经济价值或成为野草的外来植物所入侵。生态耕作示范村是具潜质的解决方法，但在改变生态系统以适应该地情况时需要有清晰的指引。大部份**河流**都有不符合可持续原则的捕鱼活动及被水坝所阻。现时华南地区所排放的**温室气体**较大部份国家为多，而且排放量正大幅提高，该区呈破碎化分布的动植物亦将会受到气候变化所影响。**买卖野生动植物**已因为害怕会引起疾病及偶尔采取的打击活动而有所减少；此外，亦有新材料辅助执法人员，但许多合法贸易并不符合可持续原则，不少非法买卖转向地下发展；市场监管及野外考察皆显示中国及海外许多野生动植物数量减少，原因是被广东、广西及海南都有消耗掉的情况¹⁸。期盼关注野生动植物的组织改善彼此间的联系，而外国使用中国产品往往未能确保其符合环保原则，再者，中国本身亦没有作此要求，结果**污染**持续，生态受破坏。新的整体计划（参看19-20页）已部署好工作项目。总的来说，华南距离达致可持续使用的目标，尚有遥遥长路，而且在许多范畴上方向都弄错了。

评分：6/30

针对对生物多样性所受的威胁

与威胁相关的目标包括：减低生境消失及恶化的速度；控制主要外来物种的侵入；保持及加强对气候变化的适应力；以及减少污染及其影响。通过实施禁止砍伐及在退耕还林的全国性政策，**森林消失**的情况已显著减少。一些地区的森林亦自然恢复起来，亦因适当的植林在一些地方也发挥功效。然而，由于强调定义含糊的「林地」目标，对森林地貌的生态状况趋势不甚了解。现时在不同地点，由于有需求，森林边缘仍持续被蚕食，一些地方仍受砍伐。在华南有关**生境恶化**的不同范畴均定义不清：需要界定及量度生态系统的完整性（无论是受保护或管理的生态系统），包括功能性的

组成部份，例如种子的传播²⁹。有时候甚至有将**外来物种**引进到自然保护区的情况，原因是误认没收所得的动物，或忽视其可能带来的负面影响，又或者误以为可以提高当地的生物多样性。要辨别外来物种并不容易，我们对许多「杂草」的原来分布所知甚少，其「入侵性」（不同于蔓延至已遭破坏的生境）亦难以确定。然而，有些具入侵性的外来物种已被证实落户于本区^{30,31,32,33,34}，包括恶名昭著的南美 *Solenopsis invicta* 红火蚁^{35,36}，它们对本土生态的影响尚未可知，而针对它们的监控计划大多不足够³。通过进行**环境影响评估**以限制生境破坏的作用发挥需时，但其所需的公众监管³⁷及更强的执法可有助机构遵守有关规定³⁸。**生态系统对气候变化的适应能力**，我们所知不多，但普遍认为与生态的完整性及多样性相关，而在自然生态系统周遭进行不利于生物多样性的耕作模式会妨碍大部份物种的适应。**控制污染**的力度视乎大家对健康的关注程度，对处理缺乏效率和引起污染的工业已取得一些进展，但挑战仍大，尤其是农业和住宅的污染源头³，在华南出现前所未有的空气污染和沉淀情况也必定对生态带来许多影响（即使是在「保护」区内），然而却鲜有相关研究，故我们对许多威胁需要有更多了解和关注。评分：18/50

维持来自生物多样性的产品和服务以保人类福祉

我们对生态系统提供的产品与服务，特别是对维持可持续生活、粮食安全和穷人健康方面的能力，主要是从负面的经验得知，例如河水泛滥、旱灾、极端天气及气候变化。后两者所引发的后果让我们明白到用「工程化」方式处理生态系统是非常危险的；用简单和单一的系统取代多元和具适应力的自然系统，令到贫苦大众和整体经济蒙受极大风险^{39,40}。犹幸政府高层渐渐意识到**平衡发展**的需要，这方面往往会在政策上⁴¹表现出来。然而，根据过往中国的经验^{42,43,44,45}及许多其他文化体系的实例，过度扩充以致超出环境的长远承载力⁴⁶，结果反而因加得减，所以谋求快速经济收益需与较长远的前景相平衡。「产品与服务」的目标不一定完全吻合保育生物多样性的目标，故此要保持天然森林保持完好无缺，或会引起矛盾，大众对通过向**生态服务付费**来支持保育的做法愈来愈感兴趣⁴⁷。在广西⁴⁸及云南⁴⁹利用碳市场以支持植林项目可以说是走在最前线，如果能适当地制定减低毁林及森林退化带来的碳排放（Reduced Emissions from Deforestation and Degradation）的机制，这个市场可为现存的森林带来好处。更迫切的矛盾是将土地分配到不符合效益的使用，例如用作**种植饲料**（玉米等）和**生物燃料**，以致白白丧失了森林生物多样性和生态系统的服务，而且即使谷物收成好，但人类**粮食的储备**却不多。对贫穷者来说，前境



从马来西亚运到广州清平龟类市场的食蜗龟
Snail-eating Turtles (*Malayemys subtrijuga*) from Malaysia meet a sorry end at Guangzhou's Qing Ping Market

Promote sustainable use

To bring about “sustainable use” means several things: to ensure products come from sustainable sources, and conversely that production areas are managed in ways consistent with biodiversity conservation; to reduce consumption that is unsustainable or impacts upon biodiversity; and to avoid endangering wildlife through international trade. Like more uniformly-wealthy countries China is very far from achieving sustainability, with massive consumption and illegal trade in timber and wildlife, endangering many groups of organism.^{18,19,20,21,22,23,24}

Consumer certification such as that of the Forest Stewardship Council (FSC) has been slow to penetrate, and consumers’ ethical awareness lags behind that in most developed countries. By contrast, per capita **Ecological Footprint** is currently far lower than in other developed countries, but this is changing dramatically.²⁵ A specific example is palm oil in Southeast Asia – devastating to forests²⁶ – of which China is the top consumer.²⁷ The region’s landscapes show the scars of **unsustainable agriculture and land use**, with soil erosion, vegetation diminished in diversity, accumulating plastic waste and the intrusion of exotic plants for economic use and as weeds. Ecological agriculture demonstration villages have potential for an alternative, but need clear guidelines to adapt ecological systems to local conditions. Most **rivers** are fished unsustainably and interrupted by dams. Meanwhile South China emits more **greenhouse gases** than the vast majority of countries, and emissions are rising dramatically; the region’s own fragmented biota will suffer as much as any from the resulting climate change. There has been some reduction in **wildlife trade** due to disease fears and occasional clampdowns, and some new materials to help enforcement officers, but much legal trade is unsustainable and much illegal trade has gone underground; market monitoring and field surveys suggest depletion of many wild populations in China and overseas due to consumption in Guangdong, Guangxi and Hainan.¹⁸ Improved coordination among conservation organisations concerned with wildlife trade is overdue. At the same time consumption overseas of products from China often fails to stipulate environmental protection, and China itself often fails to require it, such that ecological degradation through **pollution** continues. The new Master Plan (pp. 19-20) has its work cut out. In all South China is a long way from sustainable use, and is in many respects heading in the wrong direction. **Score: 6/30**

Address threats to biodiversity

Threat-related targets include: reducing rates of habitat loss and habitat degradation; controlling major alien invasive species; maintaining and enhancing resilience in response to climate change; and reducing pollution and its impact.

Forest loss was greatly curtailed by the national logging ban and by the policy of discontinuing agriculture on steep slopes. Natural regeneration has occurred in a number of areas, aided in some by appropriate afforestation, but an emphasis on ill-defined “forest land” targets sheds little light on ecological trends in the forest landscape; meanwhile demand has meant forests continue to be frayed at the edges, and logging continues in various places. The various aspects of **habitat degradation** have not been adequately defined in South China – this requires, conversely, defining and measuring integrity of ecosystems, both protected and managed, including functional components such as seed dispersal.²⁹ In some cases exotic **species** have been introduced even to nature reserves, either due to misidentification of confiscated animals, inattention to potential negative impacts or a misguided effort to increase local “diversity.” Recognition of aliens is not always easy – native ranges of many “weed” species are poorly known – and for many taxa there is uncertainty over “invasiveness” as opposed to spread into disturbed habitats. But some proven invasives are now established here^{30,31,32,33,34} including, now, the infamous South American *Solenopsis invicta* fire ant,^{35,36} whose ecological impact is yet to be revealed, and control plans are inadequate for most species.³ The potential of **Environmental Impact Assessment** to limit habitat degradation has been slow to be realised, but the requirement to involve public scrutiny³⁷ and stronger enforcement measures³⁸ offer new opportunity to improve compliance. **Resilience of ecosystems** in response to climate change is poorly known but is generally related to ecological integrity and diversity; a biodiversity-hostile agricultural matrix around natural ecosystems prevents range adjustments for most species. **Pollution control** efforts are driven by human health concerns, and have made some progress tackling inefficient and polluting industries but remain an immense challenge especially for agricultural and household sources.³ The unprecedented air pollution and deposition in South China must have many different ecological impacts even in “protected” areas, yet few studies in the region address these. Most threats, then, need far greater understanding and attention. **Score: 18/50**

China is very far from achieving sustainability, with massive consumption and illegal trade in timber and wildlife

在海南砍伐树林仍未被完全停止
Deforestation in Hainan is not a
thing of the past



并不乐观，尤其是加上气候变化的因素。评分：9/20

保护传统知识、创意及运作方式

《生物多样性公约》(CBD)亦订下目标保护传统知识、华南的民族生物学研究比云南的为少(但请参看p.63-66)创新思维和方法，及其相关知识产权和利益。近年来，许多农作物的遗传基础大大收窄，即使是拥有全中国16,000玉米种质其中2,700种的广西⁵⁰亦有此情况。现时有对策去减低这趋势，包括在广西进行先导工作：在正式和非正式的农作物系统中建立合作和互补的关系，这已被农业政策研究中心纳入国家政策。中国已实施保护非物质文化遗产的法律，而传统中药亦通过知识产权⁵¹及广泛的专家著作³而得到保护；可惜这范畴的专才在华南地区甚少。再者，国家和个人的产权已获承认，惟对原住民和当地社区在这方面的承认却一向不多⁵²。尽管本土人士已享有更多法律援助及自主权，亦受惠于旅游业，但根据中央规划政策所作出的土地使用决定，往往对他们带来影响，令他们本身的制度和知识也遭破坏^{53,54,55,56}。另一方面，主流文化亦在知识、创新思维和方法上为他们带来一些好处。评分：8/20

确保能公平、公正地共享因使用遗传资源所带来的利益

所有基因资源的转移都应符合CBD及《粮食与农业植物遗传资源国际条约》(International Treaty on Plant Genetic Resources for Food and Agriculture)；而利益当归于提供的国家。中国一向没有严评生物方面的侵权行为⁵²，就利益分享制定法规架构的步伐亦慢，但根据新制定的保育及利用生物资源总计划，中国已承诺建立有关司法系统。要保护国家产权而又不窒碍国际间的研究合作是颇具挑战性的。要保障国家利益，增加对物种鉴定能力和交换的投资似乎值得提高。根据利益分享的精神，一些

自然保护区有致力确保当地人可受惠于其生态系统，而在大部份省份，正进行的林分改革便将森林的进出权及管理权归还予所属的县或村。评分：10/20

确保能提供足够资源

金钱与科技都应从较富裕国家转移到较贫穷国家。作为次大陆，中国正以迅速但不平均的步伐从后者过渡到前者，故责任繁杂：需要从某些国家将资源转移过来，同时亦转移到其他国家；同时亦从国内较富裕地区转移至较贫穷地区。最近，华南便有较大型的保育投资项目，例如欧盟及全球环境资金在广西的工作。同时，该区一连串的自然保护区亦已升级至可获国家的拨款。然而，大部份保护区位处贫穷地带，资金不足，而在森林及环保部门辖下的主要省政府保育机构亦受到**资金和技术水平**的限制。地方缺乏资金，只得倚赖可能会为敏感地区带来负面影响的**旅游业及基建发展**。无论是作为捐助者或受助者，中国都可以做得更好。评分：8/20

整体评分：81/190或43%。自2000年至今已取得数次重大进步，但仍有许多改善空间。华南的生物多样性消失速度似乎已减慢下来，在1990年代开始，至2000年间仍能持续，但值得关注的地方是本区对全球生物多样性的影响亦已加剧。

这次评估无意聚焦于某部门或个人，事实上，他们很多都满有热忱——我们中国部的保育人员已工作了十个年头，我们对于华南保育未有尽善之处，亦需分担责任，但要真正扭转生物多样性消失，便得在世界发展的进程中作出根本的改变。看来，重要的是要诚实地面对这些挑战，而2010年的种种目标，能提供一个共同框架让我们改进和努力。我们大家都需要重新作出承诺，加上从新一代而来的创新思维，将保育生物多样性带进主流里去。🌲

极端天气及
气候变化让我们
明白到用
「工程化」方式
处理生态系统是
非常危险的

Maintain goods and services from biodiversity to support human well-being

The capacity of ecosystems to deliver goods and services, and particularly to support sustainable livelihoods, food security and health of the poor, has become recognised mainly through negative experiences, such as flooding, drought, weather extremes and climate trends. Climate change and extreme-weather events provide a reminder that an “engineering” approach to ecosystems is highly dangerous; replacing diverse and resilient natural systems with simple uniform ones exposes the poor, and the economy as a whole, to immense risk.^{39,40} Fortunately there is growing awareness in senior Government of the need for **balanced development**, often expressed in policy.⁴¹ But as ever the motive for fast economic gain needs to be countered with a longer-term vision, learning from past experiences in China^{42,43,44,45} and from the many cultures that have expanded beyond, and hence reduced, the long-term carrying capacity of their environment.⁴⁶ The “goods and services” goal may not exactly coincide with that of biodiversity conservation, raising possible conflicts with leaving natural forests intact, but interest is growing in supporting conservation through **payment for ecosystem services**.⁴⁷ Projects in Guangxi⁴⁸ and Yunnan⁴⁹ have been at the forefront of using the carbon market to support afforestation, and the market could be beneficial for existing forests if Reduced Emissions from Deforestation and Degradation mechanisms can be properly formulated. More immediate are the conflicts over allocating land for inefficient uses such as **fodder crops** (e.g. corn) and **biofuels**, such that forest biodiversity and ecosystem services are needlessly lost, and **grain reserves** for human consumption remain low despite record yields. Existing projections are not reassuring for the poor, especially when climate change is factored in. **Score: 9/20**

Protect traditional knowledge, innovations and practices

There are targets to protect traditional knowledge, innovations and practices, along with the rights to this intellectual property and benefits. Ethnobiology has received less study in South China than in Yunnan (but see pages 63–66). The genetic base for major crops has been dramatically reduced in recent years, even in Guangxi which has 2,700 of China’s 16,000 maize germplasm varieties.⁵⁰ There are initiatives to curtail this trend, including pioneering work in Guangxi toward a cooperative and complementary relationship between the **formal and informal crop systems** which has been channelled into national policy by the Centre for Chinese Agricultural Policy. China has adopted a Law on the Protection of **Intangible Cultural Heritage**, and **Traditional Chinese Medicine** is being protected through intellectual property protection⁵¹ and extensive specialist publications;³ unfortunately there are few professionals in this field within South China. A legal hurdle is that property rights have been recognised for the state and the individual, with historically little allowance for indigenous and local communities.⁵² Despite increased legal support and autonomy, and market benefits from tourism, **indigenous people** remain susceptible to land-use decisions from centrally planned policy, and their institutions and knowledge have been eroded.^{53,54,55,56} On the other hand mainstream culture has brought some

benefits in terms of knowledge, innovations and practices.

Score: 8/20

Ensure the fair and equitable sharing of benefits arising out of the use of genetic resources

All transfers of genetic resources should be in line with CBD, and with the International Treaty on Plant Genetic Resources for Food and Agriculture; benefits of use should accrue to the providing countries. China has not been a strong critic of **biopiracy**,⁵² and has been slow to develop a regulatory framework on **benefit-sharing**,³ but such a legal system is promised in the new Master Plan for the Conservation and Exploitation of Biological Resources. A challenge will be to protect national property rights without stifling international research cooperation; greater investment in **taxonomic capacity and exchange** seems essential to safeguarding national interests. In the spirit of benefit-sharing, some nature reserves have made efforts to ensure **local people** benefit from their ecosystems, while **forest tenure** reforms returning access and management rights to counties and villages are underway in most provinces. **Score: 10/20**

Ensure provision of adequate resources

Money and technology should be transferred from richer to poorer countries. Being a subcontinent in rapid but uneven transition from the latter to the former, China’s responsibilities are complex, requiring resource-transfer to some countries and from others, and from its richer to its poorer regions. In South China there has been some larger recent **investment** in conservation, e.g. from the European Union and Global Environment Facility in Guangxi, while a steady stream of the region’s nature reserves have been upgraded to qualify for **national funding**. Still, most nature reserves are in poor areas and **under-funded**, while key provincial government conservation branches, under Forestry and Environmental Protection Departments, are under constraints of **funding and technical capacity**. Local lack of funding leads in turn to reliance on potentially harmful **tourism and infrastructure** developments in sensitive areas. Whether donor or recipient, China can do better. **Score: 8/20**

Overall score: 81/190 or 43%. Since 2000 there have been some major steps forward, but there remains a lot of room for improvement. While it seems likely that the slowing of biodiversity loss in South China, which began in the 1990s, has continued in the 2000s, there remain areas of concern, and the region’s impact on world biodiversity has increased sharply.

In this assessment no reflection is intended on departments or individuals, many of whom show great dedication – as conservationists ten years into our China Programme, we share responsibility for underperformance in the region, and real reversal of biodiversity loss will call for fundamental changes in world development. It seems important, though, to be frank about the challenges, and the 2010 targets, refined during this period, give us one common framework for improving our efforts. What’s needed is renewed commitment from all of us, and innovation from a new generation to bring biodiversity conservation into the mainstream. 🌱

Climate change and extreme-weather events provide a reminder that an “engineering” approach to ecosystems is highly dangerous

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幸福的吴名川老师—— 把终身奉献给森林， 丰盛的人生回报

**Wu Mingchuan:
Lifelong Journey in the Forest**

访问及撰文：朱咏贤
Interviewed and written by Wylie Chu

吴名川老师，自1953年考入广西大学农学院学习森林经理专业开始，便与森林考察的工作结下不解之缘。50多年来，走遍广西的名山大川、深山老林，前20年从事广西全自治区森林资源和珍稀植物资源调查，先后发现了巴马的擎天树、龙州弄岗的蚬木王、靖西的桫欏等珍稀植物；后30年就更加艰巨，进行全区动物资源调查和一连串的专题研究，特别是对广西灵长类和雉科动物，以及候鸟迁徙规律及特徵等的课题，有较系统的深入调查；为广西的动植物研究填补了一个个空白。当中他饱尝野外工作的艰辛，同时也对大自然保育的工作有一番很深的体会。

祖籍广东潮安县(现改为潮州市)，吴老师祖辈几代侨居马来西亚，他青少年时代也在那里生活，及后到香港念书，直到1950年他怀著报国之志毅然从香港回到祖国，高考后被分配到广西大学森林经理专业。「我的家父是远洋老海员，希望我能跟他走同一条航道；当他得知我去学林业，他说我上山搞“五个木字”与他航海对立！」今年77岁的吴老师回忆著说。几年前他在一份中学校校友会会讯里就以「把青春献给五个“木”字」为题，分享他从事森林工作多年的点滴，及以此回应他父亲当时的一番话。

结缘五个「木」字

其实学林业也不是吴名川老师的初衷，他的志愿是到北京念地质学，为国家勘探资源。「那

时候讲究的是服从分配，祖国的需要就是我的第一志愿。」吴分享他当时的想法。所以纵使缺乏家人的支持，亦不算是自己的兴趣，他也硬著头皮只身跑到当时还未开发的广西念书。

在被迫上梁山的情况下，吴起初的学习不太理想，直到大三那年，他意识到不能这样继续下去，必须好好装备自己，同时亦开始留意自己专业的发展。「当时有关东欧国家的报导较多，我了解到例如在德国，搞林业的工资是所有行业当中最高的；日本的情况亦一样，而从事野外考察人员的平均寿命更是最长！此外想到日后的工作能接触不同的生态环境，鸟语花香，实是不错呢！」吴笑言。随著对自己专业有新的想法和了解，吴的观点慢慢改变，学习



2004年4月吴老师(左)与本园同事一起到广西南宁市老虎岭水库进行海南鸊的考察工作
Mr. Wu (left) joined our field survey for the White-eared Night Heron (*Gorsachius magnificus*) in Laohuling Reservoir, Nanning City, Guangxi in Apr 2004



喀斯特地貌：广西西南面的一片石灰岩森林
Karst landscape: Limestone forests in Southwest Guangxi

Ever since studying forest management at the Agricultural College of Guangxi University in 1953, Wu Mingchuan has been deeply connected with the work of forest survey. In more than half a century, he has travelled all over the great mountains of Guangxi. For the first two decades, he conducted surveys on forest resources and rare plants and discovered various rare species and individual trees, including *Parashorea chinensis* in Bama, “the king of *Burretiodendron hsienmu*” in Nonggang, Longzhou, and *Cyathea spinulosa* in Jingxi. After this his work became far more challenging when he surveyed animals, and launched a series of specialised studies, especially on primate and pheasant species, and on migration patterns of birds. Wu has successfully filled gaps in the study of the fauna and flora of Guangxi. At the same time, he encountered considerable hardship when conducting field surveys, which deeply shaped his views and experience of nature conservation.

Wu's hometown is in Guangdong's Chaoan (now named Chaozhou). Like his ancestors, he resided in Malaysia in his teens. He then studied in Hong Kong. In 1950 he determined to devote himself to his homeland and thus returned to China. After taking a higher-level examination, he enrolled in the forest management programme at Guangxi University. “My father was a veteran seaman and always hoped I would follow in his footsteps. When he learned I was studying forestry, he considered it an affront to his life's work,” the 77-year-old recalled. A few years ago, he contributed an article titled “My life devoted to the forests” in his secondary school alumni newsletter, sharing his experience and responding to his father's comment.

A connection with forests

In fact, forestry was not Wu's first choice; his aspiration was to explore fossil fuel resources for his motherland. Learning geology in Beijing was his true love. “At that time, we obeyed designation by the authority. Serving the needs of the country always came first.” Therefore, despite a lack of family support or interest in the subject, Wu pursued his studies in the then undeveloped Guangxi.

Without passion, Wu's learning was not plain sailing. By the third year, he realized he should better equip himself, and started exploring possible development in his profession. “At that time, the media reported a lot on the Eastern European countries. I learned that in countries like East Germany, forestry professionals were particularly well-paid. It was the same in Japan. Not only this, but the life expectancy of field researchers was also the highest! Additionally I would have the opportunity to encounter different natural environments and picturesque scenery. So it was great!” Wu said happily. With new thinking and further understanding, his studies gradually improved and laid a sound foundation for his future work.

In 1957, after graduation, Wu was designated to work in the Forestry Department of Guangxi. The speech by the then Forestry Minister Mr Lang Xi struck a chord in Wu's heart.

“No mountain is not lush; all waters are crystal-clear. Flowers blossom in four seasons; songs of birds echo in thousands of valleys. They beautify the mountains and rivers; and decorate the homeland like a painting. We strive to realize the vision: mountains are surrounded by forests, cities are surrounded by parks; villages are surrounded by lush woodlands, homes are surrounded by gardens.”

Mr Liang advised the graduates to spend eight to ten years on field work, so that with solid foundation and skills, they could then work effectively in administrative offices, scientific research institutes or universities. Taking the minister's advice, Wu requested a transfer to the Forest Survey Team of Guangxi Province. It is evident he made the right choice. From then, he thrived beyond his imagination.

In 1958, Wu became deputy leader of the Team, and for the first time joined the Guangxi Red River Integrated Research Project coordinated by the Chinese Academy of Sciences. The project was undertaken by participants from over 20 professions. Each was equipped with a horse and received favourable treatment. The authorities paid great attention to the project. Government officials took part in the meetings and gave them encouraging remarks. “As a scientist valued by the country, I was most honoured. At the same time, I also reminded myself to do my very best for the country,” Wu continued. “At that time, I was very lucky to have the opportunity to work with many veteran experts. Some were over 70 years old. I learned not only from what they taught me but also how they did their work. They were my inspiring mentors.”

「作为一个科学家，
受到国家重视，
心里很高兴，
同时亦提醒自己
要努力做好
自己的工作。」

情况亦慢慢改善，为日后的工作打下良好的基础功。

1957年毕业后被分配到广西林业厅工作，当时第一届林业部长梁希先生对从事林业工作者的一段话对他起了很大的鼓舞。

「无山不绿，有水皆清；四时花开，万壑鸟鸣。替山河装成锦绣，把国土缀成丹青。实现：山在林海，城在园林；村在绿林，家在花园。山青水秀，鸟语花香。」

吴忆述梁先生说大学毕业生应先到大自然从事十年八年的调查研究工作，待基础和本领得到充实，然后才到行政办公室、科研机关或是大学工作，事业就会有成。于是乎吴老师便要求从当时林业厅下调到广西省林野调查队工作，事实证明他的选择正确，从此走出一条从未有想像过的丰盛之路。

随著出任林野调查队的副队长，他于1958年首次参加由中国科学院统筹的广西红水河综合考察工作，有20多个专业一起进行考察，每人配备一匹马，待遇很好，同时亦受到国家的高度重视，领导人来参与开会及对他们作鼓励。「作为一个科学家，受到国家重视，心里很高兴，同时亦提醒自己要做好自己的工作。」吴表示。「当时有幸跟许多老专家一起工作，有些已是70多岁，他们言传身教，很大启发性，使我一辈子受益。」

林野调查队 - 爬山佬和探宝队

从此吴老师便全身投入森林资源调查的工作，当时广西的交通很不方便，经济也相对落后，山地占总面积三分之二，喀斯特地貌又占其中的三分之二，但有待开发的森林资源很丰富。究竟森林资源调查是什么？「森林资源调查：每年野外工作不少于八个月，每月不少于25天，每天不少于八小时，每人每月粮饷46斤！」旁人听这“具体”的演绎后，无不咋舌，称他们为“爬山佬”。

除了爬山，他们的工作还包括每天黎明起床，早饭后带上饭盒、水壶和采样工具上山，直到夕阳西下才返回营地。晚上点著油灯，压制标本、做计算、画图等工作。天天如此，周而复始。吴名川作为森林经理专业，调查后需就森林资源的开发利用作规划和设计，当中包括资源开采后送往那里加工、如何运送：利用空中运输还是设计公路或铁路等等的问题。

直到1967年，林野调查队被指派进行广西珍稀植物资源调查，因而他们又多了一个新的雅号 - 「探宝队」。当时他们需寻找的珍宝包括能用作药物和淀粉补给的植物，还有一个很重要的任务。「因为珍宝岛事件¹，国防工业急需霍而飞²和胶栲植物³资源。虽然某些植物已知能在

东北地区找到，但由于路途遥远，运送过来很费时，所以希望能在广西找到。」吴解释道。最后在吴老师的带领下调查队都不负所托，找到这些植物资源以供当时所需，他亦感到很自豪。

常年在野外进行调查工作，早出晚归，每天攀山涉水，踏破珠露湿渗到腰腿间，吴老师走遍广西的名山大川，深山老林。广西野生植物有多少种类？珍稀植物分布在哪个山头？他都了如指掌。一边翻看考察旅途的旧照片，一边听著吴老师细说在那里发现高达70米的擎天树、银杉的分布情况、隐藏在山野中的“蚬木王”有多大……我从他的面上还能看到他难掩的兴奋之情，我亦深深受到感染。

再闯野生动物世界

随著改革开放，70年代中期开始很多国际野生动物研究机构提出要和中国进行学术交流。由于中国一直来并没有系统性的野生动物研究和资料，要开展交流，就必需先进行全国性的调查，而动植物资源丰富的广西正是第一批调查的重点。

1976年，当时广西林业厅厅长张华找来吴老师，希望他能负责这项野生动物资源调查工作。「我跟他说我只在大学上过8个时小时森林动物的课，做植物资源调查时也只见过一些不知名的鸟兽，恐怕难承担重任；他打断我的说话，说那就已经比他强！然后著我用三天的时间考虑，有什么困难和需要便向他提出。」吴说。

这样吴老师便转行再闯广西的野生动物世界，而广西是唯一一个省由林业系统负责此项调查，其他省主要是由科研机构负责，例如广东是由华南所进行。他们大都已有基本的资料，不会进行大规模的全面调查，只需作重点的调查，补充一下便可以。但由于广西没有底，需由零起步，倍增调查工作的难度。

吴老师当时要求到华南、昆明和北京三地的动物研究所进行参观和学习有关野生动物知识和制作标本的技术，同时林业厅拨来三千元用作购买车辆和其他野外考察装备（当时吴每月工资大概是60元，而坐飞机从广西到广州是40多元），以及调配人手组成班子，首要任务就是猎取动物。「要向领导说明野生动物的情况，实物标本是最有说服力的科学证据。」吴表示。

¹ 1969年，中国和苏联在黑龙江省边境发生的武装冲突事件。

² 当遇上冷天气，坦克车的燃油便会凝结；如能混入霍而飞提炼得来的物质，便能避免此情况出现。

³ 可用作制造炸药，如杨梅、余甘子和大叶栲等。

50多年来机关的名称改了不少次，吴一直留守自己岗位直到退休，离职时是设计院的高级工程师 The organization has been renamed a couple of times, though Wu remained committed to his duties. He was a senior engineer when he retired from the Institute.



Photo by Wylie Chu@KFBG



白鹇
Silver Pheasant,
Lophura nycthemera

Forest Survey Team — mountain men and treasure hunters

From then on, Wu conducted forest resource surveys wholeheartedly. At that time, the transportation network of Guangxi was rather inconvenient and the economy was not yet developed. Two-thirds of the land area was mountainous. Of this, two-thirds was karst. Yet the resource of unexploited forests was very rich. What was a forest resource survey? Wu explained: “Every year, we spent at least eight months in the wild. Every month, no less than 25 days. Every day, no less than eight hours. Each of us received 46 catties of rice each month.”

The survey team were known as “mountain men”. Every day, they woke up at dawn. After breakfast, they packed their lunch, water and sampling tools and headed towards the mountains, returning to the campsite by sunset. At night, they lit an oil lamp and were busy pressing specimens, doing calculations, drawings etc. As a forest management professional, after conducting surveys Wu had to make plans for the exploitation of forest resources. They included where to process the materials and how to transport them: by air, train, or constructing new roads.

Starting in 1967, Wu’s team was appointed to research the rare plant resources of Guangxi. As a result, they won another title — the treasure hunters. The treasures included plants for medicinal purposes and starch supplements. Yet there was another important mission. “Due to the Zhenbao Island Incident¹, there was a great demand by the military for resources like *Horsfieldia glabra* (BL.) Warbg², and ingredients for making explosives³. Although it was known that some of them could be found in the Northeast, it was time-consuming to transport them all the way to Guangxi, so we had to find the resources here.” Consequently, led by Wu, the team accomplished their mission. Wu was proud of the result.

Wu devoted long hours to survey work across Guangxi. He knew the populations of wild plants and the distribution of rare species very well. Looking at the old photos, Wu was excited to tell us where he found the 70-metre *Parashorea chinensis*, the Cathay Silver Fir *Cathaya argyrophylla*, and the mighty “king of *Burretiodendron hsienmu*” hidden in the deepest part of the forest. His passion lights up not only his heart but also those of others around him.

Entering the world of wild animals

Since China’s reform and opening up in the mid 1970s, many international wildlife institutions and conservation organisations requested academic exchange with China. However there was a lack of systematic studies, and a nationwide faunal survey became necessary. With its rich fauna, Guangxi was among the first batch of survey areas.

In 1976, the then Head of the Forestry Department of Guangxi, Mr Zhang Hua, invited Wu to undertake the survey. “I told him I had only received eight hours’ training on forest wildlife in the university, and saw animals I couldn’t identify when conducting plant surveys, so was afraid I could not take up the mission. Yet Mr Zhang interrupted me saying I was already better qualified than him! He asked me to think over the task for a few days and let him know if I had any difficulties or needed anything.”

Wu then began again, in the world of zoology. Guangxi was the only province where surveys were conducted by the Forestry Ministry — in other provinces, the work was mainly carried out by scientific research institutes, like the South China Institute in Guangdong. Most provinces already had the basic information, therefore only some focused surveys were required. Without a foundation, the work in Guangxi had to start from scratch which doubled the difficulties.

Wu asked to visit the animal research centres in southern China, Kunming and Beijing to learn about wild animals and the skills of specimen making. The Forestry Ministry allocated 3,000 RMB for purchasing vehicles and other equipment for conducting field study. (At that time, Wu’s monthly salary was around 60 RMB and the air ticket from Guangxi to Guangzhou was about 40 RMB.) A team was lined up and the first task was to hunt animals. “When we talked about wild animals in front of government officials, specimens were the most convincing scientific proof.”

¹ The 1969 border conflict with the USSR in the Ussuri River, bordering Heilongjiang.

² In the past, when the weather was cold, the fuel of the tanks would freeze. Extracts of this plant were mixed with the fuel to prevent this.

³ Plants included *Myrica rubra* (Lour), *Phyllanthus emblica* Linn and *Castanea fissa* (Ret W.)

“As a scientist valued by the country, I was most honoured. At the same time, I also reminded myself to do my very best for the country.”

多年来采集标本1600多份，有600多份现存放在广西师范大学，其余的在吴老师工作机关的标本室，包括他身后的鸟雕

Wu among the collection of over 1,600 specimens. 600 of these are now kept in Guangxi Normal University, while the remaining are in the specimen room where Wu works, including this Greater Spotted Eagle (*Aquila clanga*).



Photo by Wylie Chu© KFBG

调查所得的资料 促成了56个保护区 的成立

吴老师义务管理标本室15年，常在此接待国内外到访的专家，与他们学习交流
Having managed the specimen room for 15 years on a voluntary basis, Wu is used to exchanges with international experts.



Photo by Bosco Chan© KFBG

毫无疑问，猎取动物的任务必定比采摘花果艰巨得多。吴老师说做植物调查危险性不太，如树太高自己做不来，可以请人帮忙爬上去采摘；但动物调查他们带有刀枪，伤人伤动物就麻烦，危险性大，此外当追踪动物时就顾不了这么多，很容易受伤。开枪打动物困难吗？「每种枪都有不同的射程，一般我们会在60米的距离打出去，目标范围约有1平方米，但打大小不同的动物需要不同的枪……」听起来已觉复杂，但对在此以前从未开过枪的吴来说，相比起其他的问题，这已是最容易掌握和简单的一环。

要打野生动物，首先要知道它们在那里出没，事前资料搜集很重要。吴老师会先到不同地区的野生动物皮张出口仓库调查，了解他们每年收购的皮张种类和数目有多少。「一般他们的数字很笼统，由于他们不懂，几十种分类为“什皮”堆在一起，只有值钱的才分开，好像黄麝。」然后他会问老收购员皮张是从什么地方来。「他们会告诉我那一条乡，那一个林区，那一队生产队拿来的是最多，这是一条线索。」吴说。加上整理及分析在仓库得到的资料，吴初步掌握野生动物在各处分布的情况，所以很快就会打到很多他们需要的动物。

「一般在每一个林区花两星期的时间，最长只需一个月，已经找到我们的目标动物，要不然像大海捞针是没可能的！」吴还已经将这些数据基本统计好，如历年来皮张的收购数字和种类、每一个县的猎人、枪枝、铁猫、猎狗以及生产队数目等等，希望日后能对之加以详细分析，相信当中可以发现到更多有趣的问题及变化。

现今很多野生动物都属国家保护，捕猎它们是犯法的；但根据吴老师所说以前奉行的一套是：「野生无主，谁打谁有」。当他们到不同的

森林做动物调查时，第一个晚上必定会找附近村民来开「猎人大会」，了解实际的情况。「他们都是出色的猎人，有些动物的名字可能叫不出，又或者分辨有误，如雉类的动物，但给他们看照片或图册，百分之八十他们都认识。」有时候除了图册，吴老师还带给他们一些宣传保护森林的资料，但一般他们会用来点火，不会去看。

由当地村民带路，很快便能锁定目标动物出没的大概地点。调查队白天会细心观察周围的环境，包括动物的粪便、脚印、抓痕……「人过有迹，鸟过有毛。如灵猫科的粪便是长长当中有毛，因小鸟和老鼠是它们的猎物，而它们喜欢在石头附近活动，我们就在这里等，估计它们这几天会出现。」吴说。

对吴老师来说，当时只想到要得到动物标本作凭证来编写报告。「其他人不一定相信你，没有照片，没有标本，你说有这种动物，那么拿证据出来给大家看！」虽然没有任何动物保护或保育的概念，但猎取动物时，还是有原则的。例如水鹿，看见有一群三只，打了一只之后，吴不会容许再打。「打太多便做成破坏，再者打这么多，当地人看来就只会觉得我们是为了吃它们的肉，所以足够便好了。」但吴笑言在山上工作有时候亦要从现实考虑。「好像白鹇鸡，肚饿没有其他肉食时亦会打。」

付出与收获

为期十年马不停蹄的调查，跑了80多万公里的路，到过96个县市，记不起深入多少人迹罕到之地，克服了多少严峻考验，吴老师和队员基本摸清广西动物资源的情况。他们共采集标本1600多份，探明600多种鸟兽，当中有很多为广西新记录或是受保护品种。例如黄腹角雉、黑颈长尾雉是世界濒危雉类；白头叶猴和鳄蜥是广西独有的珍稀动物，同时亦促成56

According to Wu, the task of hunting animals was far more difficult and dangerous than collecting plants. If a tree was very tall, he could seek help from others; to research animals, he had to bring along guns and knives. If either people or animals got hurt, it could be a big problem. When tracking an animal, you don't have much time to think, and this was particularly dangerous. "Different types of gun have different ranges. Usually we would shoot from 60m away at a target of only 1m². But we needed to use different guns for hunting animals of different sizes..." To me, it sounded complicated enough. To Wu, who had not used a gun before, that was the easiest part of his mission. To hunt animals, you need to know where they are.

Research can definitely help. Wu visited animal skin warehouses in different districts in order to get an idea what species and how many skins they purchased each year. "Since they didn't have the expertise, various types of skins were categorised under the group 'miscellaneous'. Only the expensive ones like Leopard Cat⁴ were differentiated from others." Wu then asked the experienced buyers about the origin of the skins. "They could tell me which production team from which village of which district was the biggest supplier, and that was a clue." After further analysing the information from those warehouses, Wu could get a general picture of the distribution of various animals and quickly track down all those on the wanted list.

"Usually it took two weeks to one month at most in a forest to get the animals. But without a background search beforehand, it was like looking for a needle in a haystack." Wu has compiled some baseline data, such as the quantity and types of animal skins purchased, figures of hunters, guns, hunting dogs, and production teams of every county in past years. He hopes further analysis can be conducted in future in which some interesting trends and issues of scientific significance can be identified.

Nowadays many wild animals are protected and so hunting them is illegal. Yet according to Wu, the truth is "wild animals are without masters. So who hunts them, can have them." When Wu and his team conducted a survey in a forest, on the first night, they would call a "hunters' gathering". Participants were villagers nearby. "They are excellent hunters. Although they may not be able to call out the name of the animals or may mistake some species like the pheasants, they can identify 80% of them with the help of photos or pictures." Sometimes, Wu gave them promotional materials on forest conservation. Yet usually the hunters would use them for fire making. Reading? Not interested!

Guided by local villagers, it would not take long to locate promising habitats. The survey team then looked carefully for signs including scats, footprints, scratches, etc. "All creatures leave marks. For instance, civet scats contain feathers or hair from their prey, like birds and rats. Since they are active among rocks, we could target some spots and wait for their appearance."

When hunting, although Wu didn't yet have any strong conception about "conservation", he stuck to the principle 'enough's enough'. For instance, when they spotted a group of three Sambar Deer⁵, they would only shoot one of them. "Over-hunting would cause damage to the environment. Besides, if we hunted many animals, the local villagers would think we were hunting for food. Therefore,

we wouldn't take more than enough." Yet Wu admitted that sometimes they had to be realistic. "When working in a mountain without food, we had no choice but shoot animals like Silver Pheasant⁶."

Good relations

In a decade, Wu and his team completed an 800,000-km odyssey. They conducted non-stop surveys across 96 counties and cities including numerous remote areas. As a result, they successfully got a general picture of the animal resources in Guangxi. They collected more than 1,600 specimens, surveying over 600 species of birds and animals. Many were newly discovered in Guangxi or protected species like the Silver Pheasant and Hume's Pheasant,⁷ or rare endemics like the White-headed Leaf Monkey⁸ and Chinese Crocodile Lizard.⁹ Based on the data collected, a total of 56 protected areas were also established. "All this helped promote education about conservation and ecological balance, and spur leaders who knew nothing about wildlife to do a better job," said Wu. The specimens also caught the attention of scholars in the U.S., Japan and Vietnam. They flew in to carry out collaborative research which facilitated international academic exchange afterwards.

Yet his mission was not finished.

"Why does this animal species live here while others are elsewhere? Is there any connection between them?" A great variety of animals live in nature, constituting an amazing forest ecology. Wu was struck by many interesting questions. Due to his passion for ecology and the pursuit of knowledge, he applied for funding from the Forestry Ministry to carry out varied specific studies.

"Take Cabot's Tragopan as an example. I was drawn by its beauty and surprised it has a pair of horns! To get to know such an interesting bird, I tried hard to gather references and delved into them." At that time it was difficult to find references and books in China, so Wu sought help from his family and friends overseas. He received a whole pile of reference books, but in fact, most of the information came from his first-hand research.

⁴ *Prionailurus bengalensis*

⁵ *Rusa unicorn*

⁶ *Lophura nycthemera*

⁷ *Symaticus humiae*

⁸ *Trachypithecus poliocephalus leucocephalus*

⁹ *Shinisaurus crocodilurus*

白头叶猴
White-headed Leaf Monkey



*Based on the
data collected,
a total of 56
protected areas
were established*

个保护区的建立。「推动保护生物多样性和生态平衡的宣传教育，特别是对那些“生物盲”的领导人起了鞭策作用。」吴说。此外采集的标本吸引美国、日本和越南的学者前来观看，并进行合作研究，促进了国际学术交流。

但吴名川老师并没有因此而停下来。

「为何这种动物会在这里出现？另一种动物在其他地方出现？当中有什么关连？」大大小小的动物生活在整个自然界中，组合成多姿多采的森林生态，吴老师在其中不断发现很多有趣的问题，因对自然生态的热爱和知识的追求，使他一再向林业局申请资金进行不同的专题研究。

「好像黄腹角雉，开始时我只知道这种鸡很漂亮，且有两只角！牛有角，马有角，为何鸡都会有角？于是从四面八方找资料，慢慢钻研下去。」但当时其中一个最大的难题就是在国内找不到参考资料和书本。于是吴便请海外的家人和朋友帮忙，给他寄来一大堆的参考书；但事实上更大部份是他自己发掘得来的“第一手”资料。

「白头叶猴的种群结构，种群分布和数量，每一个家族住在那一个山头，我都一一调查清楚。还有就是它们的觅食地点和路径，以至繁殖情况等的问题。」吴细细道来。「从不知道到知道；从不认识到认识；从没有系统到有系统；从不认真到认真；从没有追踪问题到每一个问题去了解和研究当中的生态环境和生态结构。」

包括黄腹角雉和白头叶猴，他先后写了30多篇论文，参加多次国际会议，科研成果三次获奖。此外多次获林业厅评为先进工作者奖，出任中国野生动物保护协会理事，至今还担任南宁市野生动物保护协会名誉主席、自治区野生动物保护协会常务理事、南宁市环保局专家组成员多个职务，多年来成就卓越。

当中吴老师最庆幸得到家人的支持和理解。「在深山工作，那时没有手机，数月无法跟家人联系是家常便饭。」他特别感激他的太太，每次出发时总是对他說著同一句话：放心去吧，多注意安全！「她的性格比较善良和温柔，虽然有时候也会闹情绪，但只要我讲几句好说话便可以。」吴微笑著说。有没有想家？「工作忙根本没有时间去想。」他表示。「打猎回来后，特别是在夏天，要很快将猎物处理成标本，否则变质后就很难做。所以日夜都很忙，晚上很疲累。那时年青人，倒两杯酒下去便很快睡著，一觉醒来已是天亮，在森林里睡得特别好。」

退而不休

吴老师从1992年开始领退休金，实则是退而

未全休。「有了时间去整理和思考半个世纪积累的资料和问题，精神很有寄托。」他要看的书、整理的资料和想写的文章都很多，其中一项是希望以不同的野生动植物为题，对象是中小學生，编写约二百五十字的科普文章，中英文对照，再加上一张漂亮的相片。

「每种动植物都有很多故事，例如这种蛇虽然有毒，野外遇上要特别留神；但原来同时可以用来治疗冠心病。」吴说。「相信用这种方法去介绍森林生态，学生会比较感兴趣。」其实吴名川老师一直在环境保护的宣传教育工作都不遗余力，退下来后就做得更多。好像每年3月份的「国际爱鸟日」活动，市民大众都可看到他制作的野生动物标本和图片巡回展览，以及听到他精彩的演讲。此外他还继续不同的专题调查研究，例如受外贸委托，提供豹猫每年出口数量可行性报告；主持南宁和广东汕头机场，防机鸟相撞总体规划设计方案等的工作。

这么多年从事保护及宣传野生动植物的工作，有没有特别的感受？「最重要有一个心理准备，不是为了扬名立万；作为地球上的一员，为了自己，为了他人，都应该为保育出一分力。」吴表示。「生物多样性是涉及每一个人的，保护自然生态平衡，保护生物多样性，是我们人类生存的必要。生态环境的恶化，我们每一个人最后都要承受，例如在广西，由于森林破坏，现有133条河流的水不能食用。」

工作这么艰苦，有没有想过放弃？「付出很多，但精神上得到很大的收获。最大的满足来自没有白支国家的一分钱，将全广西的动植物资源调查清楚，为广西人民、为子孙后代留下了一份宝贵的财产。得到社会人士对我的尊重，人家称我为鸟兽专家，我很高兴，问心无愧。」

两年前有人发现拟似银杉，吴应邀上山一同考察。「如果证实是一个新分布点价值就很大。」吴表示。考察队走了三个半小时，他就走五个半小时；赶不及下山，便在山洞里睡了一晚。不能根据他们搜集得来的标本和照片来鉴别吗？「希望自己能去找第一手资料！」吴笑著说他年轻时只需两个小时就可以爬到那里。还会继续野外调查工作吗？「有好的东西我一定会去！」吴更开怀的笑。

听著吴名川老师的笑声，想起在开始时提及「把青春献给五个“木”字」一文中他所写的结语：「多采多姿的原生森林，是那样美丽诱人，散发出沁人肺腑的纯净空气和甘泉，使人无比舒畅。大地如果没有了森林，那是不可思议的。森林，我至今仍然深深地热爱她，并将继续为她贡献余热。」他对森林和自然生态的热忱，推动他多年来保护野生动植物的工作，而透过他实际的行动，同时亦燃亮著他人，为自然保育的工作共同努力。🌲

「生物多样性是
涉及每一个人的，
保护自然生态平衡，
保护生物多样性，
是我们每一个人最后
都要承受。....」

"I conducted thorough surveys on White-headed Leaf Monkey including the structure and distribution of their populations. I knew very well which families lived in which mountains, where they fed, their activity routes, breeding and so on," Wu enumerated. "Over the years, I learned a lot about forest ecology and delved into every question to study the relations between animals and habitats."

Wu has written more than 30 papers, and attended several international conferences. His research results have won him three awards. He was conferred the Advanced Practitioner Award by the Forestry Department. Wu has also worked for the China Wildlife Conservation Association (CWCA) and is currently the Honorary Chairman of the Wildlife Conservation Association of Nanning, and a member of the expert team of the Environmental Protection Bureau in Nanning.

Wu is most grateful for the support and understanding from his family. "At that time, there were no mobile phones, so it was quite usual that I couldn't get in touch with my family for months." He is particularly thankful toward his wife who always asked him to take care and reassured him that she would be okay every time he set off for a field trip. "She is kind and gentle. Though sometimes she might be disgruntled about my work, she would calm down when I said something nice to her." Wu smiled when talking about his wife. "Did you miss your family when working?" I asked. "I was so busy that I didn't have time to think about this. After hunting, especially in summer, I had to make the specimens quickly before they decayed. So I had to work around the clock and was very tired when the job was done. As young men, we could all have a good sleep after drinking some alcohol. In fact, I slept particularly well in a forest!"

A devoted educator

Wu has been living on a pension since 1992. Although retired, he is still very busy. "Now, I have time to organise and contemplate all the information and issues accumulated in the last half century. That's my personal mission and I am happy to do it." One of his tasks is to write articles on wildlife for primary and secondary school students. Each one is bilingual, about 250 words, and with a beautiful photo.

"There are many stories behind every plant or animal. For instance, a snake is venomous but at the same time it is also a cure for coronary heart disease. I think using this approach to talk about forest ecology can arouse students' interest," Wu said. He has actively promoted education about environmental protection. Now retired, he works even harder on this. During International Bird-watching Day each March, the public can see his specimens and photos in touring exhibitions. At the same time Wu is invited to deliver interesting talks about birds and the environment. Besides all this, Wu continues his surveys on various themes. For instance, he was commissioned by a trading company to provide a feasibility study quantifying the annual exports of Leopard Cat. He was also in charge of the overall planning work to avoid bird strikes at airports in Nanning and in Shantou, Guangdong.

Any special thoughts after working in the area of conservation and education for almost half century? "You should know that you are not doing all this for fame, but for yourself and others; as a member of the



Photo by Wylie Chu©KFBG

吴将数百幅在野外拍摄到的动植物珍贵照片整理好，方便带到学校作森林保护的宣传和教育工作
Wu has collated several hundreds photos of rare plants and animals taken in the wild, to facilitate the public education in schools

Earth's community, you should do it." Wu continued, "When talking about biological diversity, every one of us is involved. Protecting ecological balance and biological diversity is essential for our survival. All of us will suffer from degradation of the natural environment. Take Guangxi as an example: due to forest destruction, 133 rivers are no longer fit for drinking."

Did he ever think of giving up all the hard work? "It's been pretty hard but I feel really fulfilled in my work. I conducted thorough and comprehensive surveys on the fauna and flora resources of Guangxi, leaving a valuable legacy to the people and to posterity. I am proud that I earned every cent received from my country. People respect me and I'm so happy when they call me an animal expert," said Wu cheerfully.

A couple of years ago, a suspected Silver Fir was discovered in a mountain and Wu was invited to join the survey team. "If that was a new distribution site for the species, it would be very important information," Wu said. The team hiked for three and a half hours. Yet Wu needed two more hours to reach the spot for first-hand information and spent the night in a cave. Wu said that in his younger days, he could have made it in two hours. Would he continue with his fieldwork in the forest? "When something important is found out there, I will definitely be there too!" Wu laughed heartily.

Hearing his laughter, I recalled the closing paragraph of an article written by Wu: "The colourful and vibrant primary forests are so beautiful and inviting. They give out pure air and streams. A world without forests is beyond my imagination. I will continue to devote myself to these forests, with which I am deeply in love." Wu's passion for forests and natural ecology has been motivating him for years; his devotion and action has influenced others to join hands to conserve our natural environment. 🌲

"When talking about biodiversity, every one of us is involved. Protecting ecological balance and biological diversity is essential for our survival...."



Photo by Author

船形屋：黎族人民的传统住宅，以茅草为盖、竹木为架，里面包含了厨房、客厅和卧室，图为南开乡坡告村的船形屋群。
Thatched cottages supported by bamboo poles are the traditional dwellings for Li people, in which there are kitchen, living room and bedrooms. This picture shows the Pogao village in Nankai.

我们调查到 黎族常用的草药 有400余种

海南黎族的民族植物文化

Ethnobotanical culture of the Li Minority, Hainan

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黎族是海南岛最早的居民，在海南岛有3000多年的历史，在族源上与岭南土著诸越族的一个分支“骆越”关系密切¹。由于长期居住在孤悬南海的海南岛，在历史上长期处于相对封闭、自给自足的小农经济社会，植物不仅是黎族人民衣食的保障，也是防病治病的来源，精神世界的依靠。在实践中他们积累了丰富的植物利用的传统知识和经验²。

但是，由于社会的发展，城市化进程的加剧和外来文化的影响，黎族人民的生活环境和习惯正在发生变化，传统的知识和文化也随之迅速流失。民族植物学是研究人与植物间直接相互作用的一个学科领域，研究内容包括对植物的经济利用、药物利用、生态利用和文化利用的历史、现状和特征³。通过进行民族植物学研究不但可以保存黎族对植物利用的传统知识，而且可以认识黎族人民与植物之间的关系。基于此，本人有幸在2005年得到香港嘉道理农场暨植物园公司奖学金赞助，得以进行黎族民族植物学研究。

两年多的时间里，我们走访了白沙黎族自治县南开乡和元门乡、昌江黎族自治县七叉乡、东方市江边乡、乐东黎族自治县抱龙村、五指山市毛阳镇及保亭黎族苗族自治县毛感乡的二十多个村寨。通过咨询当地卫生部门以及村里的头人，如村长、村委书记和护林组组长等人，采用关键人物访谈法(Key Informant interviews)，在各个村寨选取当地有名的草医作为访问对象。运用参与式观察法(Participatory Observation)，与当地群众同吃同住同劳动，随草医在野外采集草药，记录药用植物的名称、用法、用途和药用部位等。访谈过程中应用“5W+1H法”进行提醒，即What(什么)、When(何时)、Where(何地)、Who(谁)、Why(为什么)及How much(多少)。如，“这种草药叫什么名？在哪里采的？用什么部位？谁用(小孩或大人)？怎么用？

用多少？”在访谈和野外调查的基础上进行室内整理，包括凭证标本的鉴定、资料整理和评价，最后进行民族植物学编目，将结果记录和表现出来。编目的内容包括植物学名、中文名、当地名、标本号、使用部位、使用方法、治疗疾病等⁴。

黎族同胞不但热情好客，而且对植物也非常熟练。他们自己种的菜不多，常常是在山里或者田里随手采些野菜回家，便可做成佳肴了。如益母草*Leonurus japonicus*、刺芫荽*Eryngium foetidum*、革命菜*Gynura crepidioides*、假蒟*Piper sarmentosum*、少花龙葵*Solanum nigrum* var. *pauciflorum*、崩大碗*Centella asiatica*、雷公笋*Costus speciosus*等便是黎族人民饭桌上常见的菜肴。至于山上的野果就更多了。如大果榕*Ficus auriculata*、岭南山竹子(黄牙果)*Garcinia oblongifolia*、烟斗柯*Lithocarpus corneus*、木奶果*Baccaurea ramiflora*。

植物不仅解决了黎族同胞的温饱问题，而且为他们提供了医疗保障。几乎每个村寨都有一两个擅长利用草药为村民治病的草医。他们不是专职的医生，平时跟其他村民一样在田里耕作，有人上门求医了才去采集草药。村民服药后痊愈了，医药费不拘多少，但照例得送给草医一只鸡和一两斤酒，以示答谢。过去草医行医治病时往往是采用鸡卜和祭神等巫术，或巫术和药物相结合。现在黎族草医逐步摆脱了巫术的束缚，以植物为主的药物疗法成为疾病防治的主要手段。黎族的草药种类多样，我们调查到黎族草医常用的就有400余种。黎医认为草药有公母之分，男人用母药，女人用公药。如猴耳环*Pithecellobium clypearia*为公，亮叶猴耳环*P. lucidum*为母。这些草药具有相同的疗效，而且外形相似。黎医还有“以形治形”的治疗方法，即用与身体患病部位形态相似的草药治疗疾病，如扇叶铁线蕨*Adiantum flabellulatum*、翅柄铁线蕨*A. soboliferum*、



Photo by Author

益母草为黎族人民常吃的野菜，用水煮或炒食。
Chinese Motherwort *Leonurus japonicus* collected in the wild can be boiled or fried.

The Li Minority are the indigenous group of Hainan Island, where they have lived for more than 3,000 years. The Li people are believed to be descendants of the ancient “Luo Yue”¹, a branch of the aboriginal Southern Yue of Lingnan (South China). Having long inhabited an island in the South China Sea, the Li Minority has remained rather isolated and self-sufficient, and a peasant economy prevails. To them, plants are more than a constant supply of food and clothing; they are an essential source of defence against various diseases, and even in the spiritual realm. A great pool of traditional knowledge² and experience have been accumulated regarding the use of different plants. However social development, accelerating urbanisation and the introduction of exotic culture have altered both the living environment and lifestyles of Li people, resulting in a rapid loss of traditional knowledge and culture.

Ethnobotany is the study of the direct interactions between plants and people, and its focus is on the history, current status and characteristics³ of the economic, medicinal and ecological purposes served by plants. It thus helps preserve and inform people about traditional knowledge of plant use. With this in mind, I was much honoured to receive a KFBG Studentship grant in 2005 to further my study on the ethnobotany of the Li Minority.

During the study we spent two years conducting interviews in some 20 ethnic villages in several counties. They included Yuanmen and Nankai Townships in Baisha Li-minority Autonomous County, Qicha in Changjiang Li-minority Autonomous County, Jiangbian Township in Dongfang City, Baolong Village in Ledong Li-minority Autonomous County, Maoyang Township in Wuzhishan City and Maogan Township in Baoting Li-minority Autonomous County. Two strategies were applied during the interviews: key informant interviews and participatory observation. The former was applied after seeking advice from village heads, village party secretaries and team leaders in forest conservation to identify a target list of key informants, among whom renowned healers and herbalists were chosen for interview. The latter strategy was to gain a close and intimate familiarity with the local community by staying with the herbalists, joining them for herb collection and jotting details of every plant encountered including their name, application, purposes and medicinal uses. Interviewees were asked “5W1H” (What, Where, Which, Who, When, How) questions to get specific information, for instance: “what is the herb?”; “where to collect it?”;

“which part is applied?”; who (child or adult) should use it?”; and “how/how much to apply?”. The data collected from interviews and field surveys were subsequently sorted, followed by identification of voucher specimens, data compilation and review. An ethnobotanical inventory of medicinal plants will then be developed to present all detailed records. The inventory will contain particulars of every species, including scientific name, Chinese name, voucher number, which plant part is used, clinical application and healing properties⁴.

Li people are renowned not only for their hospitality, but also their intimate acquaintance with plants. The vegetables they grow are limited, as they gather wild vegetables from the hillsides or fields, such as *Leonurus japonicus* (= *L. heterophyllus* or *L. artemisia*: Chinese Motherwort), *Eryngium foetidum* (Long Coriander), *Gynura crepidioides* (Okinawa Spinach), *Polygonatum cyrtoneura* (Chinese Solomons-seal), *Piper sarmentosum*, *Solanum nigrum* (Black Nightshade), *Centella asiatica* (Gotu Kola) and *Costus speciosa*, which are household delicacies. Wild fruits are more varied than the vegetables, and include *Ficus aurantiaca*, *Garcinia oblongifolia*, *Lithocarpus corneus* and *Baccaurea ramiflora* (Burmese Grape).

Plants not only feed the Li people, but also safeguard their health. In almost every village, there are at least one or two herbalists to serve the community. They are not professional medical practitioners and will provide medical consultation only by appointment, carrying out farm work with other villagers on normal days. There are no specified charges for the consultation, but when the villager recovers, the herbalist will usually be given a chicken and one or two catties of wine as a token of gratitude. Herbalists were once shamans who used to cure villagers with the aid of divination by chicken bones and worship, or with witchcraft. Herbalists nowadays have cast off this traditional practice, but tend to make great use of plants as prevention and cure against diseases. According to our surveys, 400 plant species are widely used by herbalists, and the healing effects are even gender-specific; male patients should be treated with “female” plants and vice versa. For instance, *Pithecellobium clypearia* and *Pithecellobium lucidum* are considered masculine and feminine respectively, and they are supposed to have similar healing properties and appearance to one another. In addition, the Li people have faith in another therapy, which involves consuming a certain part of a plant that resembles the wounded part of your body morphologically, to healing effect.

According to
our surveys, 400
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herbalists

木奶果是黎族人民喜食的野果之一，味酸。
The sour *Baccaurea ramiflora* is one of the Li's favourite wild fruits.



Photo by Author

黎族人民认为
山猪和各种动物
都是有灵魂的，
可以勾引各种动
物灵魂的植物
叫山猪药

鞭叶铁线蕨 *A. caudatum*、半月形铁线蕨 *A. philippense* 等的小羽片与指甲相似，用这些植物治疗指甲脱落⁴。

黎族信奉万物有灵，在他们看来所有植物都是有灵魂的。所以草医采集草药替村民治病的时候，会先对着要采的草药念一些咒语。咒语的大意是，有人生病了，要请草药回去，不要怪他因为采摘而对草药造成的伤害。他们相信，只有念过咒语草药才能发挥作用。植物既然被赋予了灵气，它们在黎族人的精神世界里便占据了重要的地位。像这类与人类意识形态和精神世界密切相关的植物就叫做文化植物。村里有人去世的时候，会在每户的大门及粮仓门前挂上鲫鱼胆 *Maesa perlaria*、刺苋 *Amaranthus spinosus*、野茄 *Solanum coagulans*、白藤 *Porana decora*、龙眼 *Dimocarpus longan* 或荔枝 *Litchi chinensis* 的枝叶，并绑上红线。据说鬼怕这种植物，可以起到避邪的作用，保护家庭的平安。黎族人民认为山猪和各种动物都是有灵魂的。可以勾引各种动物灵魂的植物叫山猪药。他们认为谁家种了“山猪药”，谁家就能把山猪勾引过来，就像抓住了山猪的灵魂一样，为狩猎提供有利的条件。由于山猪药具有神秘的作用，人们以一种崇敬的心情小心看护或把它们种在庭院的周围⁵。调查发现了6种山猪药，其中两种是野生的，分别是走马胎 *Ardisia gigantifolia* 及异色血叶兰 *Ludisia discolor*，4种为外来的栽培植物，分别是变叶木 *Codiaeum variegatum*、朱蕉 *Cordyline fruticosa*、白蝴蝶 *Syngonium podophyllum*、小彩叶草 *Coleus pumilus*。这些外来的栽培植物是什么时候通过什么途径被引入黎族地区？黎族人民是如何感知它们具有神奇的力量呢？这些都是值得我们思索和深入探讨的。

黎族有纹身的传统。纹身是黎族母系氏族社会的遗存，是自然崇拜、祖先崇拜、图腾崇拜的艺术结晶，是黎族历史上凝聚力、生命力的标志¹。现在只有少数老年妇女身上还保留纹身的历史印痕。纹身的工具很简单，有藤刺、拍针棒和染料。藤刺有两种，白藤和红藤 *Daemonorops margaritae*，前者用得比较多。拍针棒是纹身时用来拍打藤刺的工具，材料不定，竹子、小木棒或筷子都可以。染料是纹身时用来绘染花纹图案的，主要有麻风树 *Jatropha curcas* 和板蓝 *Baphicacanthus cusia*。

黎族具有悠久的历史 and 灿烂的文化。黎族的民族植物学文化是一个宝库，是我国民族文化的重要组成部分。如何深入挖掘和保存这些正在消失的传统文化，需要更多的有识之士投入更多的研究工作，需要社会各界的关注和参与。

致谢

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Thus, fingernail-shaped pinnules of the Maidenhair ferns *Adiantum fiabellulatum*, *A. soboliferum*, *A. caudatum* and *A. philippense* are used to cure people with split fingernails⁴.

Herbalists believe that “every creature, including plants, has its own spirit.” They will cast a certain spell requesting herbs to accept their apologies before collecting them back home for healing the sick, and the herbs will become potent only after the spell is cast. In this sense, plants are endowed with universal life force (like the Japanese *reiki*), and play significant roles in the spiritual world of Li people. They are also called “cultural plants,” being closely linked to ideology and spirituality. When people in the village pass away, branches or leaves of *Pluchea indica*, *Maesa perlaria* (Indian Camphorweed), *Amaranthus spinosus* (Spiny Amaranth), *Solanum coagulans*, the rattan *Porana decora*, *Euphoria longana*, *Dimocarpus longana* (Longan) or *Litchi chinensis* (Lychee) will be tied with a red rope on the front door of both their home and grain stores to keep ghosts away and keep villagers and their families safe. Li people also believe Wild Boar and other animals have souls, which can be captured by certain plants. Whoever plants them will be able to capture the Wild Boar, and the availability of such plants can be beneficial for hunting. Reverence towards the enigmatic function of these plants has made Li people tend and plant them around their courtyards⁵. A total of six plants of this extraordinary nature were found in the surveys, of which four – *Codiaeum variegatum* (Croton), *Cordyline terminalis* (Ti tree), *Synagonium podophyllum* (White Butterfly) and *Coleus pumilus* (Dwarf Coleus) – are exotic and cultivated, and the remaining two – *Ardisia gigantifolia* and *Ludisia discolor* (Jewel Orchid) – are wild-growing. Questions like “how and when were these cultivars introduced to the Li Minority?” and “how do they sense that the plants are of supernatural power?” are worth exploring.

Tattooing is a cultural relic of the matriarchal clan communes established by the Li Minority. Tattoos are unique works of art for the worship of nature, ancestors and totems; they are long-standing symbols of coherence and vitality¹, although today only a few women retain these traditional markings on their faces. Tattooing requires simple tools like a rattan tree thorn, a wooden rod and dyes. The thorn is of either *Porana decora* or *Daemonorops margaritae*; more often the former. A needle brush is traditionally used to remove thorns, but bamboo sticks, wooden sticks or even chopsticks can serve the same purpose. The dyes are extracts of *Jatropha curcas* and *Baphicacanthus cusia* for drawing and painting different patterns on the face.

The Li Minority have a deep-rooted and vibrant ethnic culture, to which ethnobotany is integral. To elucidate and cherish this fading traditional culture will need further effort from other researchers, as well as concern and engagement from other sectors of the community.

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Photo by Author

黎族妇女的纹身有一个重要的特点：面纹从两耳连接面颊处，以数根三角形的曲线连在一起。

One distinctive feature among the Li tattooed women is that their face tattoo extends from both ears down to the chin in several pairs of triangular lines.

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Li people also believe Wild Boar and other animals have souls, which can be captured by certain plants

图一 琼楠属的大型果实 (直径5公分，长7公分)
Fig 1 Large fruit of *Beilschmiedia* sp. (5 cm in diameter and 7.5 cm length)



吴世捷摄于海南省铜铁岭 Photo by NG Sai Chit in Tongtieling, Hainan

琼楠属

琼楠属是樟科的一个大属，全世界有超过二百种，中国共纪录有35种¹，在华南地区分布的22种当中，有14种属为该地区独有。成员以乔木为主，部分种类可高达30米。琼楠属的特征是拥有较大型的果实，长度可达7-8公分，直径达5公分，内有一颗大型种子。

由于对耕地的需求和木材殷切，中国的树林在上世纪被大量砍伐，这无疑是这些大型乔木的最大威胁。事实上，中国纪录的琼楠属植物中，有超过三分之一被列入中国物种红色名录，包括4个极危种 (CR)、6个濒危种 (EN) 及3个易危种 (VU)²。虽然中国境内的天然林现已严禁砍伐，但单靠禁砍，而欠缺适当的种子传播者，并不能完全保障琼楠属 (或其他拥有大型果实的树种) 的延续。虽然对琼楠属的繁殖生态所知不多，然而含丰富脂肪的樟科果实一向依靠雀鸟传播种子³。琼楠属的种子相对较大，在自然界中相信只有大型食果鸟类 (如皇鸠、犀鸟等) 才能有效将种子传播⁴。如图一中的琼楠属果实，在海南岛似乎只有山皇鸠 (*Ducula badia*) 能传播这种大型种子。当这些种子传播者因狩猎或生境破坏而变得稀少时，亦会严重影响这些树种的繁衍。

(吴世捷及罗益奎著)

Slugwoods

Beilschmiedia spp.

Beilschmiedia is a large tree genus with more than 200 species in the family Lauraceae¹. Up to 22 species have been recorded in South China (35 species in China); among them 14 species are endemic to the region, including species that may reach 30m in height. The genus is characterized by its relatively large single-seeded fruit up to 7-8cm in length and 5 cm diameter.

More than one-third of the species recorded in China are listed in the China Species Red List², including 4 Critically Endangered species, 6 Endangered species and 3 Vulnerable species, with logging and farmland encroachment considered the largest immediate threats to this group. Although large-scale logging of natural forest has been banned, merely protecting a number of individuals in a protected area is not sufficient to ensure the recovery or the long-term survival of *Beilschmiedia*, or other large-fruit tree species, if their fruits are not being dispersed by the appropriate dispersal agents. Although relatively little is known about their reproductive ecology, the Lauraceae family, which typically has lipid-rich fruits, is consistently dependent on birds for fruit dispersal³. Their ovoid fruit shape is also consistent with that of typical large fruits eaten by large frugivorous birds such as imperial pigeons and hornbills⁴. Some of them, such as the one shown in Figure 1, can nowadays only be dispersed by Mountain Imperial Pigeons (*Ducula badia*) in Hainan. Decline of these dispersal agents in South China through hunting and habitat destruction will eventually threaten the survival of these trees.

(By Ng Sai Chit and Philip Lo)

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图二 另一种琼楠属植物—山潺的果实则较为细小。
Fig 2 *Beilschmiedia appendiculata* has smaller fruit.



吴世捷摄于海南省霸王岭 Photo by NG Sai Chit in Bawangling, Hainan



冠斑犀鸟

分布：分布广泛，由印度北部到东南亚及大巽他群岛。在中国现在只分布于西藏南部、云南南部及广西西南部地区。

特征：大型林鸟，全长约75厘米。头、背和胸黑色，腹部白色，翅膀黑色，翅膀边缘白色，尾巴黑色，尖端白色。面上有两块白斑，嘴巴特别大，呈蜡黄色。

生态与行为：栖息于树林的巨木间。常集小群生活。主要以果实作为食物，间中会捕食细小的脊椎动物和昆虫一如琼楠属一类拥有大型果实的树种都依赖牠们播种。犀鸟有独特的繁殖习性，成鸟交配后，雌鸟就会进入巨树的树洞里产卵、孵化和育雏，进洞后雌鸟会将自己的排泄物混着种子、腐木等堆在洞口，雄鸟也在外面用湿土、果实残渣等将树洞封闭，仅留一裂缝，雌鸟可伸出鼻尖于洞外，接受雄鸟的喂食，到雏鸟快要飞出时，才啄破洞口而出。

现状：在中国，现在仅分布于零碎地区而且极度稀有。由于体型巨大和独特的繁殖习性，栖息地破坏、砍伐大树和捕猎是犀鸟生存的最大威胁。国际上因为冠斑犀鸟的分布广而且在部份地区的数量不少，所以还没有被列入IUCN红色名录中。在国内，因为栖息地破坏和捕猎，已经被列入国家二级重点保护及中国物种红色名录列为近危物种¹。它们现时在广西的分布也许只局限于在一个区域。

(李国诚著)



Oriental Pied Hornbill *Anthracoceros albirostris* (Shaw, 1808)

Distribution: Widely distributed from North India to Southeast Asia and the Greater Sundas. In China, now only in southeast Tibet, south Yunnan and southwest Guangxi.

Identification: Large forest bird, with total length up to 75 cm. Black head, back and breast; white belly; black wings with broad white trailing edge and black tail with white tip. White facial markings. Large pale yellowish bill.

Ecology and behaviour: Found mostly in forest areas with big trees. Usually in small flocks. Mostly frugivorous, also taking small vertebrates and insects—important dispersers for large-fruited trees such as slugwoods. Hornbills have a unique breeding habit; after mating, the female will enter the nest in a tree hole, then the pair will proceed to imprison the female inside with a wall of mud and debris, leaving only a narrow slit through which she can poke her bill and get food from the male. Inside the tree hole, the female will lay the eggs, incubate them and look after the chicks. The female will break the wall when the chicks are ready to fledge.

Status: Now extremely restricted and rare in South China. Because of their large body-size and unique nesting habits, habitat destruction, logging and hunting are the main threats to hornbills. The Oriental Pied Hornbill is not currently listed as Threatened in the IUCN Red List because it has a wide distribution and in some areas is still quite common. In China, because of habitat destruction and hunting, it has been listed as nationally Near-threatened¹ and in the State's Protected Species List (Class II). In Guangxi it may be continued to a single site..

(By Lee Kwok Shing)

参考文献 References

¹ 汪松，解焱（主编），2004。中国物种红色名录，第三卷。高等教育出版社，北京。

Wang S and Xie Y (eds.), 2004. *China Species Red List Vol.I*. Higher Education Press, Beijing.

存款与借贷

地球的生物多样性是我们的生物财富、生物资本。存款是居住在海洋、陆地与空气中的每个基因、每个群体、每个物种与每个自然社群。不管我们相信这些是由神所创造，或由之前的生物演化而来，铁一般的事实是：这些乃是我们仅有的，其他地方并无生命形式。目前尚无证据显示未来人类可能会登上火星或其他遥远的星球，在当地囤积树种、订购大熊猫替代品或取得已经灭绝的生物种类。同时，根据目前的生物科技，我们想透过科学奇迹创造生物根本毫无希望。任何人都知道，生物多样性完全无可替代，如果这一点经过证实为非会是很棒的事，但我们对此并无丝毫期待。

……若从生物透过生态系统服务或资源能对人类提供直接贡献来看，九十六个生物「门」并非全部「有用」，但相关的物种超乎多数人的想像。此外，大量工业创新范例不断指出我们无法预测未来哪一种物种或群体会有用处，甚至是极端重要。

在某些领域，断言人类不可能需要地球上所有物种成为一种流行。也许某天这种主张会成为事实，但哪些是多馀的？我们知道，早在人类进驻地球前生态系统就已演化几十亿年了。它们不需要人类，不管有没有我们，都是继续往前迈进。当生态系统内容含括人类时，情况就有所改变。人类的确需要生态系统服务，每项服务中都包含数目不详的物种。关键问题是，到底需要多少物种才能维持我们活下去的服务？有些物种的灭绝似乎并未对生态服务造成太大影响；比方说，有百万人居住在大型掠食者几乎都已经消失的欧洲。由道德或是美学因素来看，这类消失造成的悲剧并不会比较小，但生态系统服务至今并未显示出太多不利效应。

在人类过度使用杀虫剂、或将过多废弃物倒入河流或海洋之际，我们很快地看一下一个问题，即当人们有意或无意滥用生态系统服务时，到底要用掉多少物种？物种会因此遭到大规模杀戮，导致相关的服务失能。如果能够以实验的方式先行处理这类意外或灾难，会有很大助益，因为如此我们至少可以判定事件前、后会出现哪些物种、数量多少。也因此，我们可以知道当服务减少甚至崩溃时，哪些物种也会随之消失。有时答案非常明显，如因植被遭到破坏而引起的洪水、山崩或土壤盐化，允其在森林与丛林地带。但是，我们需要的物种关键数字为何，哪些会变成最重要的物种，又在何时何地，面对这些问题我们仍然无法知晓答案。

我们认为较好的做法是把「多馀」的概念转化为「备用」。正如现代喷射客机当中的「备援」系统设计是针对电子、引擎或结构失误所做的保险，「备援」物种也可为我们仰赖的自然系统的失误提供保险。我们认为任何物种都很重要，只是时间早晚而已。比方说，随著气候持续变迁，有谁知

道哪些树种会变成主要的木材来源？一旦杀虫剂与生物科技控制法失效，有谁知道会出现哪些可控制害虫的甲虫或蚂蚁？哪一种海洋动物会构成未来的水产养殖业，哪些奇特的物种又可以提供重要的产业或药用化学物质？

现在的人类毫不在意地挥霍存款。全世甲的森林、土壤与渔业资源逐渐缩减，海洋、淡水、土壤与空气遭受各式各样的污染。我们甚至让气候变得更糟（或是换句话说，我们一直将气候视为问题，将来很可能会转变成恶梦）。如果资本耗尽，我们的子子孙孙该怎么办呢？

答案是要确定我们不会失去生物多样性，而这意味著要保育。我们已知人类必须仰赖几百万个基因、群体、物种以及自然社群，亦即所谓生物多样性。保育并非只是环保人士的课题而已，而是每个人的责任。面对让我们得以存活的自然过程，有谁可以担负得起忽视的后果？

想像力与行动力是保育课题的两大重要成分，明丝娃博士在泰国强力展现这一点。她被迫面对一群犀鸟偷猎者，这种鸟是雨林中一种美丽、罕见的大型鸟类。忝不知耻的收藏家付出大笔金钱想获得鸟蛋、雏鸟或成鸟，必要时猎捕人会用暴力攻击他们。明丝娃博士进入偷猎者的村落，让他们了解这些鸟活著的会比死亡时更具身价。如今她一手栽培出一群由前盗猎者组成的团体，引领观光客进入森林当中观赏活生生的犀鸟，因此赚进比偷猎时更高的报酬。真是了不起的范例！犀鸟和其他林栖地完好无虞，当地人民因为拥有不受干扰的森林而赚得利润，来自全球的观光客则因为多了解生物多样性而受惠。这项冒险行动的资金，来自赞助个别鸟巢的观光客与居住在曼谷的地市人。

我们都知道有三种过度会减低生物多样性并引发物种灭绝：人口过度、开发过度与消费过度。全球性企业体在农业、林业、渔业和工业方面使用非永续性的技术，创造大规模城市发展，产生全球性污染。虽然生物多样性是其根本，但这一切活动却每天都在消毁生物多样性。已开发国家拥有财富与权力可影响大规模的经济活动，但他们的行动却深具破坏性，事实上是在耗损我们的资本。

本书要说的是，为何这么多人认可人类最重要的资本乃是自然资本：也就是生物多样性，亦是真实世界的资本。以财务资本为基础的货币，是由生物多样性产生的维生系统与产物衍生而来。我们清楚地了解，人类选择以财务资本运作世界，因此，要让世界运作的第一步，就是承认这两种资本的真实价值，然后组织人类经济制度以保护两者。多数人接受财务资本的价值；自然资本的价值则处于刚要获得认可的阶段。我们希望，在自然制资本的价值遭到破坏之前人们就会接受这个概念。

中文译本：《为什么不能把蚊子杀光：大自然对人类的秘密用途》译者：吴书瑜

Savings and Loans

The biodiversity of Earth is our biological wealth, our biological capital. The savings are every gene, every population, every species, and every natural community that inhabits the oceans, the land, and the air. Whether we believe that God put them there or that they evolved from earlier creatures, the stark truth remains that they are the only ones we have – there are no life forms anywhere else. As yet there is no evidence whatsoever that one day humans will be able to fly to Mars or some other remote planet to stock up on tree species, order giant panda replacements, or obtain refills of extinct phyla. Nor is there any hope, based on the current status of biotechnology, that we will be able to create organisms through the miracles of science. Biodiversity is, as far as anyone knows, totally irreplaceable. It would be marvelous to be proved wrong, but we're not holding our breath.

...Not all of the ninety-six phyla are known to be "useful" in the sense that they contribute directly to human welfare through ecosystem services or resources, but many more are involved than most people think. Further, numerous examples of industrial innovations show repeatedly that we can never predict what species or populations are going to be useful, or even desperately important, in the future.

It has become fashionable in some circles to assert that humanity cannot possibly need all the species on Earth. This may turn out to be true one day, but which ones are redundant? We know that ecosystems evolved for billions of years before humans inhabited the planet. They did not need us, and they will carry on with or without us. Yet when the context includes people, the situation changes. People do need ecosystem services, each of which involves an unknown number of species. The key question is, how many species are needed to maintain the services that keep us alive? It seems that some extinctions do not much affect those services; for example, millions of people live in Europe where nearly all the large predators have been eliminated. The tragedy of loss in these cases is no less because it is a moral or aesthetic issue, but ecosystem services to date show little sign of detrimental effects.

We get glimpses into the question of how many species we need from accidental or intentional abuse of ecosystem services, as when pesticides are overused or too many wastes are dumped into rivers or the sea. Species then are killed in large numbers and the services often fail. It would be highly advantageous if some of these accidents or disasters were treated as experiments – so that at the very least we could determine which species were present, and in what numbers, before and after the event. Thus, we might know which species are missing when the service declines or breaks down. Sometimes the answers seem obvious, as when floods and mudslides or salination of soils follows the destruction of vegetation, especially of forests and woodlands. Still, what the critical number of species needed may be, or which species may turn out to be the most important, and at what time and place, we simply do not know.

We think it is wiser to turn the whole concept of redundancy around. Thus, in the same way that "redundant" systems are engineered into modern passenger jets as insurance against electrical, engine, or structural failure, "redundant" species provide insurance against failure in the natural systems on which we depend. We are suggesting that any species could be important, sooner or later. Who knows, for example, what tree species will emerge as our main source of timber as the climate continues to change?

Who knows which beetle or wasp will emerge to control pests when pesticides and biotechnological solutions fail? What species of marine animals will form the aquaculture of the future, or which bizarre species will provide an essential industrial or medical chemical?

Right now the human race is recklessly squandering its savings. All over the world forests, soils, and fisheries are in decline. The oceans, our freshwater, soils, and air are polluted in various ways. We are even changing the climate for the worse (or to put it another way, weather that we always considered a problem is likely to become a nightmare). What will our children do if the capital is used up?

The answer is to make sure we do not lose biodiversity, and that means conservation. We...all depend on the millions of genes, populations, species, and natural communities that we call biodiversity. Conservation is not just for environmentalists, it is everyone's business. Who can afford to ignore the natural processes that keep us alive?

Two major ingredients of conservation are imagination and action, as dramatically demonstrated by Pilai Poonswad in Thailand. She was faced with gangs of poachers taking hornbills – huge, beautiful, rare birds of the rain forest. Unscrupulous collectors paid large sums for eggs, chicks, or adults and the poachers defended their booty with violence when necessary. Pilai went to the villages where the poachers lived and showed them that the birds were worth far more alive than dead. Today she has a growing band of ex-poachers earning far more by taking tourists into the forest to see live hornbills than they ever made by stealing them. A superb example! The birds and their rain-forest habitats remain intact, the local people profit from the presence of the undisturbed forest, and visitors from all over the world learn a little about biodiversity. The venture is funded by tourists and by city dwellers in Bangkok who sponsor individual nests.

We all know the three Os that cause the decline of biodiversity and the extinction of species: Overpopulation, Overdevelopment, and Overconsumption. The global human enterprise uses unsustainable technologies in agriculture, forestry, fisheries, and industry and produces massive urban developments generating worldwide pollution. Although based on biodiversity, all these activities contribute daily to its decline. The developed countries have the wealth and power to influence economic activity on a vast scale, yet their actions are subversive in the very real sense that we are steadily eroding our own capital.

This book shows why so many people have accepted that our most important capital is natural capital: biodiversity. ... this is the capital of the real world. The currencies based on financial capital derive from the life-support systems and products generated by biodiversity. We know full well that humanity has chosen to operate in a world of financial capital. The way to proceed, therefore, is first to recognize the true worth of the two kinds of capital and then to organize the human economy to preserve both. The value of financial capital is accepted by most people; the value of natural capital is only starting to be recognized. Our hope is that the concept of natural capital is accepted before its value is destroyed.

Excerpted with kind permission from *Wild Solutions: How Biodiversity is Money in the Bank*, by Andrew Beattie & Paul R. Ehrlich. Yale University Press, 2001.

范畴

《森林脉搏》由嘉道理农场暨植物园中国项目出版，每年两期，为致力从事华南地区自然保育人士报导环保资讯，提供讨论及交流渠道，藉以启发读者。《森林脉搏》的内容题材包罗森林和生物多样性各个保育范畴，尤以改善资源管理与减少威胁为报导主题。凡从事相关保育的工作者、森林管理人员、科研人员及顾问等都欢迎投稿。

稿件类别

1. 特稿及短文

稿件须连同相片一并递交，特稿及短文分别以1,200及500字为限，题材务必与华南地区的保育事项有关，例如：

- 保护区管理
- 濒危物种、类群或生态系统组成部份的野外考察或资料整理
- 生态修复及生物多样性保育的项目与个案研究
- 相关公约、法律与政策的推行与实施
- 森林及野生生物资源利用之重要性及影响

2. 来函

回应前期刊登文章之稿件以少于500字为宜。

3. 资讯速递

以报导最新保育动态或重要消息并且未经刊载为合，亦欢迎提供关于经费来源信息与相关会议、培训班等资料。来稿以少于500字为宜。

4. 新闻焦点

根据已印刊的资讯及其他可靠报导来源，以少于200字撮要有关华南及毗邻地区的森林与物种保育资讯。

5. 出版刊物

简单介绍近期出版的书籍、报告与书评。诚邀作者及出版社投寄书刊供编辑评述，亦欢迎投寄对近期出版书籍的书评，建议进行书评前先谘询本刊编辑的意见。

稿件格式

有关稿件的一般格式，可参阅近期出版的《森林脉搏》。来稿中、英文皆可，双语版更佳。除可递交打印稿外，作者亦可把文件储存作WORD或RTF档案以电邮形式提交。封页须标明题目、作者之邮政及电邮地址全写，及其他共同撰稿的作者姓名和地址。此外，稿件须顺序编码，图表应力求简洁易懂，标题恰当。首次提及的物种，应按其科学名称书写，并在调查方法内注明分类命名法之采用准则。

递交方法

作者可透过邮寄或电邮方式递交文稿（地址如下）。付寄邮件必须声明（1）文稿并未公开发表或投寄他处（获准翻印的文章除外），及（2）投寄稿件前已取得所有作者同意。如文稿内容与其他已文付印刷或正在整理的刊物内容有重迭，应注明并有关稿件一并递交。随特稿及短文应附上不少于两张JPEG格式的照片（彩照更佳），标题则须附注于文稿内。另欢迎作者投寄一幅或多幅高素质的彩色幻灯片或照片，以作甄选本刊封面照之用。

审阅及校对

来稿须经编辑委员会审阅，如有需要，本刊会谘询其他专家之意见。来稿一经接纳，为使内容更明确清晰，本刊或会进行修改。除非来稿经大肆修改、加插资讯或需澄清，否则本刊编辑不会就其他修改另行通知作者。

其他

来稿一经刊登，撰稿者将获赠该期的《森林脉搏》两本，其版权即归嘉道理农场暨植物园所有。稿件请寄：

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Scope

Living Forests magazine is published twice a year by the China Programme, Kadoorie Farm and Botanic Garden. It aims to inform, inspire and serve those dedicated to nature conservation in the South China region, providing a platform for discussion and information exchange. *Living Forests* publishes material on all aspects of forest and biodiversity conservation, particularly with the potential to improve management and reduce threats. We welcome submissions by forest managers, researchers, advisers and practitioners with related objectives.

Content

1. Articles

Feature articles (1,200 words) and Short articles (500 words), with photographs, are invited on topics relevant to the magazine's focus in South China. These include, but are not limited to:

- Considerations and guidelines for effective management of protected areas
- Field research and reviews on the status and distribution of threatened species, taxonomic groups or ecosystem components
- Initiatives and case studies for ecological restoration and biodiversity conservation
- The working of relevant conventions, laws and policies
- Research on the importance and impacts of forest and wildlife utilisation.

2. Letters

Contributions (generally <500 words) in response to material published in previous issues of the magazine.

3. Notices

Items (generally <500 words) concerning recent developments in conservation or important announcements, other than from published sources. Other items of interest include news of the availability of grants or funding opportunities, and announcements of relevant meetings, workshops and conferences.

4. In the News

Concise reports (<200 words) on news of forest and species conservation interest in South China and surrounding areas, based on published sources including reputable websites.

5. Recent Publications

Brief announcements of new publications and book reviews. Authors and publishers are invited to send publications to the Editors for potential review. Reviews of recent books are also welcomed; prospective reviewers are advised to consult the Editors in advance.

Preparation of manuscripts

Authors are advised to consult a recent issue of *Living Forests* for general style. Contributions can be in English or Chinese or (preferably) both. Electronic submissions in either Word or Rich Text format are acceptable. The cover page should contain the title, corresponding author's full postal and email address (as applicable) and names and addresses of any additional authors. All pages should be

numbered consecutively. Tables should be self-explanatory and each with an appropriate caption. The first time a species is mentioned, its scientific name should follow. Where necessary, the basis used for nomenclature of taxa should be indicated in the methodology.

Submissions

Manuscripts should be sent either by post or email to the Editors (address below). A covering letter or email note must confirm that (1) submitted manuscripts have not been published or submitted for publication elsewhere (or, in exceptional circumstances, that permission for republication has been acquired), and (2) all authors have agreed to the submission of the manuscript. If there is overlap with other publications, including any in press or in preparation, this should be stated and the papers concerned sent to the Editors. For articles a minimum of two (preferably colour) photos in JPEG format and captions should be attached separately with the body text. Authors may also submit one or more high quality colour slides or photos related to their submission for consideration as a photograph for the front cover.

Review and editing

Manuscripts are subject to review by an editorial committee; if appropriate external reviewers may be consulted. After acceptance, manuscripts may be edited to enhance clarity; such editing will be sent to author if substantial changes have been made or additional information and clarification is needed.

Others

Contributors will receive two free copies of the issue in which their paper is published. The copyright, upon acceptance of an article, will be transferred to Kadoorie Farm and Botanic Garden. To contact us, please write to:

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