

森林脉搏

Living Forests

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**学以致用：
如何将科学应用在保育政策与管理上？**

**Knowledge to practice:
How can science be
applied to conservation policy
and management?**



嘉道理农场暨植物园简介

Introduction to Kadoorie Farm & Botanic Garden

嘉道理农场暨植物园是香港的一所慈善机构，早在1951年，嘉道理家族的两兄弟，罗兰士与贺理士，创办本园以推行农业辅助计划，帮助从大陆移民来的贫困农户自力更生。该计划帮助了超过三十万名香港农民改善生活。两兄弟于九十年代先后辞世，但其家族的慈善活动仍延续下来。嘉道理慈善基金会为中国境内及东南亚地区服务贫困社群的计划提供资助，而嘉道理农场暨植物园则因应香港社会的转型，现已建成为一所自然教育与保育中心，并根据1995年通过的香港法例成为一家公益事业公司。我们的任务是「提高大众对人与环境关系的认识，透过保育与教育，积极改善世界」。本园现推行的计划有野生动植物保育、可持续农业和环境教育等等。

Kadoorie Farm & Botanic Garden (KFBG) is a charity based in Hong Kong, with a tradition of agricultural aid dating back to 1951, when the two brothers Lawrence and Horace Kadoorie began a self-help scheme for poor immigrant farmers from China. This scheme was to help over 300,000 Hong Kong farmers to achieve a good standard of living. Both brothers died in 1990s, but the family's philanthropic activities continue. The Kadoorie Charities fund projects throughout China and the South East Asia region. KFBG, in response to changing priorities in Hong Kong, has become a centre for environmental education and conservation, enshrined by a Government Ordinance in 1995 as a public corporation. The Mission Statement of the KFBG is "TO INCREASE THE AWARENESS OF OUR RELATIONSHIP WITH THE ENVIRONMENT AND BRING ABOUT POSITIVE CHANGE IN THE WORLD THROUGH CONSERVATION AND EDUCATION". KFBG now has thriving programmes in wild plant and animal conservation, sustainable agriculture, environmental education and other areas.

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於《森林脈搏》內刊登之文章，其內容純屬作者之個人意見，與本園立場無關。

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

本期内容

In this Issue

世界各地的生态学家和保育学家为了他们的工作是怎样不为人理解、他们渊博的学问是如何不受人重视而愈感沮丧随之出现的后果是：物种的消失、退化的生态系统、没落的前境。而专家们只能从“我早就说过了”这句话中得到丁点的慰藉。

今期我们会探讨有关如何将物种及生态系统的科学知识，应用在保育政策及推行的工作上，多位经验丰富的保育学家会与读者分享他们的观点。

亚洲保育专家约翰·马敬能指出学者们要让保育得到外界的认同是责无旁贷的，并且应负上更大的责任。与此同时，官员也应与科学家好好合作。事实上他的观察道出很多人的心声：好像本园考察队于1997在一个设有研究站的广东自然保护区调查时，发现保护区的主管对自己管理的森林内正进行些什么研究一无所知——试问考察数据又怎可能整合到管理上去！

这些观点与王春东及苏文拔的想法互相呼应，他们是海南野生动植物自然保护中心的官员，负责管理全省的自然保护区，文中他们也认同加强保护区管理的科研基础的必要性。

高质素的科学是更需要并且更适用于整合政策。世界雉类协会主席菲力普·麦格温，在中国及其他邻近国家累积了一些宝贵经验，建议应强化科研工作的相关性、价值及逻辑，使之能协助解决重要问题。

至于该如何加强中国在科学与政策上的联系，特别是植物方面，世界自然保护联盟首席科学家杰弗里·麦克尼利给予我们很多参考意见。他特别指出中国在植物科研上有卓越的成就，在推动公众人士对植物的欣赏方面亦应有相同的投入。

最后有来自英国生态学会的科学政策经理尼克·达斯卡，他主要介绍该会近年来努力推动科学家参与政策制定的情况，当中很多的经验都值得我们借鉴。

本期的「华南保育先驱」有出色的广西植物学家韦发南，他以专家的角度，剖析当地生态系统的转变，努力希望提高人们对植物的认识。此外，在「奖学金专题」龚世平和其他考察人员汇报这些年来研究海南淡水龟的工作点滴，指出龟类贸易所带来的威胁已迫在眉睫，保育管理人员实不容忽视。

「珍稀物种小档案」今期介绍两个生态上相关的华南物种——裳凤蝶及其寄主植物。至于「节录」部分讲述有关人类基因的限制，是一篇值得我们深思的文章。它带出如果我们了解这些限制并多加留神，说不定能改善现时情况，看来这也是一门应用科学。

There is a tendency among ecologists and conservationists worldwide to despair at how little their work is understood, and how their own in-depth understanding is under-valued. The consequences are obvious: species loss, ecosystem degradation, a diminished future. "I told you so" is scant consolation.

In this edition we explore some of the issues around the progression from scientific understanding, of species and ecosystems, to positive policy and action. A number of experienced conservationists took up our invitation to contribute their views.

John MacKinnon, veteran of Asian conservation, points out that academics are not themselves blameless, and can take on greater responsibility in ensuring conservation is given due recognition. At the same time officials could make better use of scientists. His observations will ring true for many: in 1997, when visiting a Guangdong nature reserve with its own research station, the KFBG team found the reserve director was quite unaware of what kind of research was being done in his own forests – clearly no way to integrate the findings into management!

Some of these points are echoed in the perspective of potential "users" of science – Wang Chundong and Su Wenba of the Hainan Wildlife Conservation Centre, which oversees the province's nature reserves. Clearly there is recognition of a need to further strengthen the scientific basis of reserve management.

Science is more deserving and likely to be integrated if it is of high quality. Phil McGowan, whose World Pheasant Association has clocked up a fair bit of experience in China and neighbouring countries, recommends tightening up the relevance, value and logical consistency of the scientific work, so that it reliably answers important questions.

Further ideas for bridging the science-policy gap in China, with particular reference to plants, come from Jeff McNeely, chief scientist at the World Conservation Union (IUCN). He calls in particular for stepping up the pace with which China's academic excellence is matched by its commitment to the public appreciation of its flora.

A final contribution comes from the United Kingdom, where Nick Dusic is the science policy manager for the British Ecological Society (BES). In recent years the BES has greatly expanded its efforts to engage scientists in policy, and much of this experience will be of relevance in China.

This issue's "Conservation Pioneer" is Guangxi's great botanist Wei Fanan, who has witnessed much change in the region's ecosystems through expert eyes, and done more than his bit to raise awareness of plants. Other contents include a report from the studies of freshwater turtles in Hainan by Gong Shiping and co-workers, who highlight the urgent threat from the turtle trade and the need for conservation managers to take note.

In the spotlight are two interlinked South China species, a butterfly and its host plant. We also excerpt a thought-provoking piece about our genetic constraints, and how we all might do well to be more aware of them. Applied science indeed.

读者问卷调查

Readership survey

我们在三月份进行的读者问卷调查，共收回76份问卷，你们的意见对《森林脉搏》的路向提供了许多有用的资料，谨此向各位予以感谢。在收回的问卷中，约五成读者（48%）是来自学术界，其他包括非政府组织人员（17%）、政府官员（11%）和商界人士/顾问（13%）。当中近一半都是本刊的长期读者，阅读的期数超过十期。

我们特别希望知道的是：《森林脉搏》若改为电子版，是否能符合读者的需要？结果显示读者们的意见并不一致。虽然互联网服务对大多数读者（87%）来说已很方便及可靠，而差不多所有读者（97%）都认为电子版的《森林脉搏》是可以接受的；可是，仍然有超过半数读者（55%）表示还是喜欢看印刷本多一点。我们也明白杂志印刷本跟在线阅读必存在一些差别，故现阶段我们还未作出最后决定。

其中一个有趣的发现是，平均来说，读者会把刊物传阅给3-5人，会这样做的主要是研究员和非政府组织的人员，而政府官员及商界人士则较少。不少读者（68%）表示会阅读整份刊物，而官员们则比较有选择性，一般只阅读约一半内容。近乎全部读者（99%）都认为《森林脉搏》“清晰易懂”，而就“与工作息息相关”和“资料准确可靠”两方面也有相当高的评价（两者均达90%）。有些官员看似对内容的准确性及可靠性有所存疑，就这方面的问题欢迎你们随时跟我们分享你的想法和建议。而刊物的内容最能配合读者那方面的工作？依次为研究（64%）、生境或物种管理（53%）、教育（41%）、改善项目筹划或汇报（23%）和政政策发展（16%）。

刊物内容方面，读者普遍爱看主题性的文章，尤以政府官员们为甚。实际上主题性的文章也是大部份读者们（76%）认为最值得阅读的内容，其次是野生动植物记录（73%），尽管这些记录只是间歇地在期刊发表。其他如资讯及新闻（49%）、珍稀物种小档案（49%）及华南保育先驱专访（33%），而在官员类别则高达63%。另外，虽只有数位读者选择节录一环，但相信文章对他们有很大的启发。这些个别意见都让编辑们感到尤其欣慰，我们很高兴知道透过《森林脉搏》能让你们知得更多，同时亦能带来启发。

其他的建议包括就生物多样性的保育和保护区的管理，希望能提供更多的参考实例、评估及建议（我们筹备多时有关保护区管理的资源手册快将出版，请大家密切留意）。而有些读者则对主题性的文章饶感兴趣，希望能获取个别项目及科研工作的更全面报告。就《森林脉搏》的定位：有读者认为需要有清晰界定，这是一份科学性的期刊，还是一份科普杂志；另外一位读者指《森林脉搏》是一份让他能轻松地阅读的同时，又能令他对生活作反思的科学杂志。亦有读者问及将过往发行的期物上载供查阅的可行性以及希望作者能留下电邮地址以作通讯。此外，还有一些个别的意见包括：建议我们介绍更多关于红色名录及相关出版物的消息；增加保护区工作人员与原住民观点的报导；减少人物的访问但对物种的介绍可全面一些；有两位则希望能有更清晰的地图指示；另一读者建议提高本刊的可读性，以作更广泛的传阅；最后有一位读者期望知道更多有关沿岸及海洋生态系统及品种的报导（但这现时不在我们“森林”的报导范畴内）。无论如何，我们会详细参考你们每一个宝贵的意见并尽量作出相应的改善。

这次调查仅得到十分一的读者答覆——虽然就一个问卷来说，是一个不错的回应率；但我们希望的是能得到你们每一位的意见，在这方面无疑令我们有点失望。这也许反映到我们的工作还未能得到大家的关注，特别是为政府官员。忠实读者们对我们的支持，以及表达的意见，对我们都十分重要，并推动我们不断向前，满足你们的需求。在此我们希望各位能继续对本刊提出意见，不论是正面也好，负面也好，好让我们能为保育森林及其生物多样性方面作出贡献。

Our latest reader survey has given us helpful information for the future of *Living Forests* – our thanks to all who responded. Almost half of these (48%) work in academia, other major reader groups being NGO staff (17%), government officials (11%), and businesspeople/consultants (13%). Half of these are long-term readers, having seen ten or more issues.

A key thing we wanted to know was whether a fully electronic version of *Living Forests* would be satisfactory to readers. The answer was mixed. Internet access has improved considerably, and is easy and reliable for most (87%) respondents. Still, most people (55%) prefer the hard copy, although most (97%) could accept a change if necessary. We are aware that there are pros and cons of both options, and remain open to viewpoints for the moment.

One interesting finding was that on average each magazine is shared with 3-5 other people, with researchers and NGO staff more likely to share than government officials or businesspeople. Most readers (68%) reported reading almost all of the magazine; officials tended to be more selective, reading about half. “Clarity and ease of reading” was rated high for almost all (99%) respondents, as were “relevance to work” and “accuracy and reliability” (both 90%). Several officials seemed to have doubts about the latter category; we invite you to share any specific concerns or suggestions you have on this. Major reported applications were research (64%), habitat or species management (53%), teaching (41%), project preparation and reporting (23%) and policy development (16%).

Regarding organisation of the magazine, there was a general preference for a thematic approach, especially among officials. In fact thematic articles were among the features rated most relevant to most readers (76%), followed closely by Wildlife Whereabouts (73%), despite the intermittent nature of these field records. Also highly appreciated were Notices and News (49%), Species in the Spotlight (49%), and Conservation Pioneers (33%, and 63% among officials). While Excerpts were singled out by only a few readers, they clearly made a deep impression on these few. The individual comments received were particularly gratifying – it is rewarding to the editors to know we can inform and sometimes inspire the readers.

Among the suggestions received were several for more empirical examples, evaluation and recommendations on biodiversity conservation and nature reserve management. (We do have a lot to convey on this, and will soon be bringing out a resource book – watch this space.) Several readers asked for more detail in the thematic articles, including more comprehensive reports on projects and scientific research. One reader felt *Living Forests* should be more clearly defined as either a scientific journal or popular science magazine; another found it “relaxing to read a scientific magazine and rethink our lives at the same time”. One asked for it to be available as an archived reference, and one asked authors to leave their email addresses. Individual suggestions were for more news on the Red List and related publications, and more perspectives from reserve staff and indigenous people. One reader asked for fewer interviews, and for a more comprehensive Species in the Spotlight; two asked for clearer maps, and one to make it more readable for wider circulation. Finally one reader asked for more reports on coastal and marine ecosystems and species (not currently within our “forests” remit). We’ll digest all these suggestions, and take them on board as much as possible.

Only about one in ten of the magazine’s recipients replied to this survey – quite respectable as questionnaire surveys go, but disappointing considering we urged all readers to reply. This might reflect our failure to engage others, particularly those working for government; perhaps some cannot be engaged! The enthusiasm of our core readers, and the importance of your work, will keep us striving to meet the needs you have expressed. In the meantime we hope all will continue to give us feedback, positive or negative, so we can all work better to conserve our forests and their biodiversity.



森林是气候变化的救星

在2006年11月召开的联合国气候变化框架公约第十二次缔约方大会以及京都议定书第二次成员大会¹上，都确认了森林在提升对气候变化的适应力以及通过“减少毁林”来减少温室气体排放两方面的重要性。此外，英国政府在2006年10月发布的斯特恩报告²是一份具影响力的文件。报告认为，防止热带森林遭到进一步破坏是未来国际气候框架中的一项关键内容，因为每年排放的温室气体有20%来自毁林，超过了全球交通运输的排放量。斯特恩报告还认为，减少毁林是成本低廉的策略。从放弃的利用机会计算，每年的成本仅仅是50-100亿美元，折合每少排放一吨二氧化碳只需要花费1-2美元，是减少化石燃料排放成本的三分之一。根据碳的市场价格计算，原始雨林每公顷的价值可以高达8千美元³。由33个发展

中国家组成、巴布亚新几内亚和哥斯达黎加牵头的热带雨林国家联盟自从2005年成立以来⁴，一直在呼吁国际社会为减少森林破坏提供资助。它们的主张已经得到了热带生物学和保护协会的支持。⁵

资料来源：¹Center for International Forestry Research, 12 January 2007 www.cifor.cgiar.org/Publications/Polex/polexdetail.htm?pid=765; ²UK *Stern Review on the Economics of Climate Change* www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/stern_review_report.cfm; ³Laurance WF, 2007. A new initiative to use carbon trading for tropical forest conservation. *Biotropica* 39(1): 20-24. ⁴Coalition for Rainforest Nations www.rainforestcoalition.org ⁵*Tropinet* 17(3): 5. www.atbio.org/tn_v17_n3_Sept_2006.pdf

气候变化：日益临近的威胁

跨政府气候变化专门委员会的第四份评估报告为决策者提供的三份摘要在2007年上半年公布。这些由多位作者撰写的文件，根据丰富而翔实的证据，在前面三份报告的基础上，进一步明确了气候变化的影响以及应该采取的应对措施。

第一工作组名为“自然科学的基础”的摘要是在2月份公布的¹，它作出的关键结论是：

- 全球大气中二氧化碳、甲烷、氧化亚氮的浓度已经远远超出工业化之前的浓度。二氧化碳的增加主要是由于使用化石燃料和土地利用改变造成，甲烷和氧化亚氮的增加主要是由于农业生产造成。
- 地球从1750年开始变暖，几乎可以肯定(可能性大于90%)是由人为活动引起的。
- 在人类活动对极端天气事件的众多影响中，最能够肯定的是：大部分陆地冬季的温度升高，寒冷日数减少；大部分陆地在夏季的温度更高，而炎热的日子的数量和出现频率增加；大部分陆地上更频繁地出现热浪；大部分地区暴雨的频率增加。
- 上一次极地地区温度长时间比现在的为高发生在12万5千年以前，两极冰块的融化使海平面升高了4-6米。
- 现在大致上可以肯定(可能性超过90%)，20世纪中期以来的大气温室气体增加是引起全球温度增加的主要原因。
- 目前预测每10年温度将升高摄氏0.2度，而且大部分模型的预测结果都是相同的：即使温室气体浓度现在稳定下来，温度和海平面的升高也将持续几个世纪。

第二工作组的“气候变化的影响：适应和危害”摘要是在4月公布²。报告认为，目前很多自然系统正在受到区域性气候变化特别是温度升高的影响。在过去30年里，人为活动引起的变暖已经影响到很多物理和生物系统，但由于非气候因素的作用，一些区域性影响尚难于确定。

报告预测未来可能发生影响有：

- 高纬度地区和一些湿润热带地区的年平均河流径流量和水量将增加10-40%，而在一些中纬度干旱地区以及一些干旱热带地区，这两个指标将减少10-30%。喜马拉雅地区的冰川融化将减少河流径流。东亚流域将面临淡水水量减少，洪水频率增加。
- 生态系统自身的复元能力将不足以应对气候变化及其带来相应的干扰以及其他全球性的变化(土地利用改变、污染、资源的过度利用)。陆地生态系统的净碳吸收量可能在2050年以前达到最高，然后开始减少甚至变成负值，从而令气候变化的影响增大。
- 当温度升高摄氏1-3度，中、高纬度地区的农作物产量会略微增加，东亚的作物产量最多能增加20%，低纬度地区和中亚的作物产量将会减少，并因加剧的干旱和洪水而进一步恶化；渔业生产将会受到损害。
- 海岸被侵蚀的风险将不断增加，珊瑚将大面积死亡，洪水将给亚洲和非洲大型三角洲上的几百万居民带来不利影响。
- 热浪、洪水、风暴、火灾、干旱、痢疾类疾病、心血管、呼吸系统疾病和一些传染病将造成营养不良，影响到人类健康。在东亚，水灾及旱灾将引致痢疾类疾病的增加。

报告的结论是，一定程度的气候变化现在是不可避免的，采取对应措施是必须的，特别是针对短期影响的。如果不采取任何应对措施，气候变化长远来看很可能超出自然、人工和人类系统的承受能力。随着全球温度的不断升高，气候变化带来的每年损失也将增加。

第三工作组的“减缓气候变化”摘要是在5月份公布的。温室气体的增加(从1970年到2004年的25年增加了70%)，以及在现行政策下温室气体预计将继续增加，报告认识到采取措施来减少温室气体排放的巨大的经济价值。从

短期至中期(到2030年)来看,减排潜力最大的领域分别是建筑(约折算为6 Gt二氧化碳/年,能源供应(约3 Gt),工业(约3 Gt),农业(约3 Gt),林业(约2 Gt),交通(约2 Gt)和废物处理(约0.7 Gt)。

涉及林业的减排活动只需要较低的成本就可以有效地减少排放,增加碳汇。林业65%的减排能力分布在热带,大约50%的能力可以通过减少毁林的方式来实现。减缓方案可以与适应气候变化的活动结合起来,而且还能带来诸如增加就业、增加收入、生物多样性和流域的保育、可再生能源供应和扶贫等其他效益。能有效减缓气候变化影响的林业政策、措施和方法有:

- 利用经济诱因鼓励造林、减少森林破坏以及保留和管理森林;
- 土地利用规定及其执行。

这些措施却因为缺乏投资和土地使用权不清而受到限制。

政府的支持措施包括提供资金、税收优惠政策、制定标准和培育市场,都对缓解影响非常重要。政府的支持是合理的,因为主要的受益群体是大众而不是私人,然而,在世界大多数能源研究中政府的经费已经开始降低,现在仅仅是1980年水平的一半。除了资金,政府还需要提供适当的体制、政策、法律及法规架构来维持投资规模,鼓励有效的技术转移。

减缓方案可能会与其他方面的可持续发展项目产生多种协同效应。减少栖息地丧失和毁林会有利于生物多样性、水土保持和减少温室气体排放。造林和生物能源的植林能够帮助退化土地的恢复、调控径流、保持土壤碳储量、及对乡村经济发展有利,但也可能与粮食生产活动争地,如果设计不好则会造成生物多样性丧失。

资料来源: ¹www.ipcc.ch/SPM2feb07.pdf; ²www.ipcc.ch/SPM6avr07.pdf; ³www.ipcc.ch/SPM040507.pdf

中国新的责任

中国目前是世界最大的温室气体的排放国。2006年中国制造了62亿吨二氧化碳,超过了美国的58亿吨。2006年全球排放的二氧化碳比前一年增加了2.6%,主要是由于中国和世界其他地方的煤炭消耗量增加所致的。在中国2006年的排放量中,有9%(5.5亿吨)是来自水泥生产。北美人均年碳排放量为20吨,仍然排在世界炭污染榜的第一位,而中国的人均年碳排放量则是3.5吨。

资料来源: Netherlands Environmental Assessment Agency, June 2007, www.mnp.nl/en/dossiers/Climatechange/moreinfo/ChinaownoinCO2emissionsUSAinsecondposition.html

世界自然保护联盟在海南进行生态补偿研究

世界自然保护联盟正在与中国专家合作,在海南进行支持生态系统服务¹补偿的政策研究。这项倡议是加拿大国际发展署在华实施的政策选择项目²的工作之一,这项试点研究主要关注海南省中部的少数民族地区。海南省国土环境资源厅以及其他省级部门的官员已经两次前往加拿大,对这个新兴的领域进行学习。这个项目将帮助海南省制定关于生态服务付费的规定,以促进对生态系统的保护。

资料来源: ¹www.iucn.org/places/canada/news/062808_China_May_Trip.htm; ²www.popinchina.com/index.html

养龟场给野生龟类雪上加霜

中国目前有一千余家养龟场,产值超过10亿美元¹。这些养龟场是亚洲野生龟类的主要收购者,以牺牲野生龟类种群为代价,攫取庞大的短期经济效益。如不遏制目前趋势,大部分野生龟类都将灭绝。养龟场规模巨大,但因缺乏监管,因此成了法律的漏洞,让非法野生动物商人把从野外捕捉的龟变身成“人工繁殖”的合法身份。2004年的一项调查表明,海南的11家养龟场饲养的龟有33种,当中的31种包含从野外捕捉的个体,包括中国的黄缘闭壳龟 *Cistoclemmys flavomarginata* (濒危)、三线闭壳龟 *Cuora trifasciata* (极危)、黄喉拟水龟 *Mauremys mutica* (濒危)、山瑞鳖 *Palea steindachneri* (濒危)和四眼斑水龟 *Sacalia quadriocellata* (濒危),和从印度尼西亚、越南、美国、南美和欧洲来的龟种。

资料来源: ¹Shi Haitao, Parham JF, Lau M and Chen Tien-Hsi, 2007. Farming endangered turtles to extinction in China. *Conservation Biology* 21(1): 5-6.

白暨豚: 经已丧失的国宝

2006年底农业部组织了一次大规模的白暨豚调查,有六个国家的科学家参加了这次为期六周的调查,使用了两艘考察船以及高质量的光学仪器和水下声纳,从三峡大坝到上海的3,500公里的江段展开研究。期间并未发现任何白暨豚,估计可能已经灭绝。最后一次在野外发现白暨豚已是在2004年。

白暨豚是第一种因人为活动而灭绝的海豚。

队员同时调查了列为极危的长江江豚,发现其数量不足400只。武汉水生生物所的王丁认为,江豚的种群很小而且以每年7%的速度迅速减少,情况与20年前的白暨豚相若。

资料来源: baiji.org, www.baiji.org/expeditions/1/overview.html; tursiops.org <http://tursiops.org/modules.php?name=News&file=article&sid=1911>, March 2007

促请中国在热带林保护中发挥领导作用

热带生物学与保护协会在其发表的昆明宣言(2006年7月21日)中,呼吁热带亚洲国家扩大自己的自然保护区体系、遏止造成热带林退化的非法活动、把自然保护区连接成区域性和跨国性网络,并提供资金来制定以科学为本的森林保护和恢复策略¹。热带生物学与保护协会强烈建议决策者应更积极地与熟悉情况的科学家建立并保持对话,以便更好了解当区和其中的重要自然资源所面临的重大威胁。该会也呼吁中国发挥领导作用,提倡并提供更多的资金,为亚洲热带地区制订自然保护和可持续的发展策略。目前,进入中国市场的大部分木材都是由破坏环境²的盗伐方式得来的。欧盟和北美的消费者有可能抵制中国的木材产品,这两个地区占中国家具和木材出口的三分之二。



資料來源：¹Tropinet 17(3): 5 www.atbio.org/tm_v17_n3_Sept_2006.pdf; ²Tropinet 18 (1): 1-2 www.atbio.org/tm_v18_n1_jan_2007.pdf

斑鳖逐步走近灭绝边缘

世界上最大的淡水龟类——斑鳖——正步向灭绝的边缘。斑鳖在全世界仅有的五个圈养个体，其中一只已在上海动物园死亡，使得这个物种又向灭绝走近了一步。死去的斑鳖来自云南的红水河流域。这只斑鳖死亡后，尚存的四只个体有三只圈养在华东的江苏苏州，另外一只来自红水河流域，形单影只地生活在越南河内的还剑湖。2006年9月实施了一个紧急行动计划，要把中国的四只斑鳖（现在仅剩3只）集中到苏州进行人工繁殖，同时调查还有没有其他圈养或野外个体（包括史海涛在广西和广东进行调查）。目前教育、研究、募集资金和与越南的协调等项目均已开展。

資料來源：www.asianturtle.org/library/bulletins/ATCN_bulletin_January_2007.html; www.turtlesurvival.org/Rafetus%20Workshop%20Report.pdf; www.asianturtle.org/library/Action_Plan_for_theConservation_of_the_Giant_Yangtze_Softshell_Rafetus_swinhoei.html

气候社区生物多样性联盟认可云南腾冲造林项目

中国云南腾冲的造林项目¹是世界上首两个按照国际“气候、社区和生物多样性 (CCB)”标准认证的林业项目之一。这个造林项目位于高黎贡山国家级自然保护区西南部，由保护国际和美国大自然保护协会牵头。它是京都议定书洁净发展机制所批准的第一个小型林业项目。它之所以通过气候、社区和生物多样性的查核，是因为它不仅符合京都议定书的要求，而且还将展示如何在遏制气候变化的同时，提供环境和可持续发展的效益。项目将在大约5平方公里的区域内用秃杉、光皮桦、桫欏和云南松等本土树种进行造林，预计在今后30年里将从大气中固定16万吨二氧化碳²。评审人员建议以后还要对生物多样性影响监测进行进一步的修改³，这方面在CCB联盟使用的标准中尚有待厘清。

資料來源：CCB Standards website: ¹www.climate-standards.org/news/news_feb2007.html; ²www.climate-standards.org/projects/files

[/Tengchong_CDM_SSC_AR_PDD_final.pdf](http://Tengchong_CDM_SSC_AR_PDD_final.pdf); ³www.climate-standards.org/projects/files/Va_lidation_Report_Tengchong%20CCBA_30.1.07_incl%20Annex.pdf

广西综合林业发展和保护项目

世界银行批准了一亿美元，来发展和保护中国的森林。项目目标包括：帮助中国加强森林管理的效率和机构设置，以提高木材生产、流域保护、自然保护区管理，以及加强具有全球重要生物多样性地点的保护。另外，全球环境资金还提供了5百万美元，用于资助和实施加强自然保护区和当地社区合作的管理计划。

資料來源：China View, in www.recocif.org/site/fileadmin/docs/e-letter2006/Community_Forestry_E-news_2006_30Dec06.html#w

国家林业局叫停金光收购云南林场

国家林业局已经制止金光集团收购云南一家国营林场58%的股份的计划。国家林业局要求省政府在批准兼并之前要进行彻底的价值评估。这项兼并涉及转让670平方公里的国有森林。国家林业局还命令中国的14家区域森林资源管理办公室制止盗伐。2007年国家林业局将出台一项新的国家林业发展和造林的新计划，包括各种森林类型的发展计划。

資料來源：China Daily 8 Feb 2007, www.chinadaily.com.cn/china/2007-02/08/content_803968.htm

背景資料：www.illegal-logging.info/papers/APP_Hainan_Project.pdf www.eepsea.org/ev.php?ID=8403_201&ID2=DO_TOPIC

野生动物交易猖獗影响热带亚洲的森林生态

一项对亚洲的狩猎历史的回顾显示，在过去50年，商业贸易引致的狩猎的影响已超过具有四千多年历史的自给自足式的狩猎，而且正在威胁更多的物种¹。很多传播大型种子以及取食林下植物的动物已经被捕杀殆尽，而对取食种子的动物的影响却不一，这对森林内部的生态过程产生了影响。绝大部分的食肉动物都面临威胁。由于虎的数量急剧下降，进而开始用云豹的骨头来替代虎骨入药，使得这较小的猫科动物在东南亚²都面临灭绝的

境地。有关部门试图在印度支那将偷猎者绳之以法，可是却招来恐吓和执法错误。在马来西亚的商人已经不再运输活生生的动物。他们把穿山甲宰杀后经过真空包装再运往中国。在印度尼西亚，人们把淡水龟磨成粉末，作为蛋白质和药物出口。宠物市场也在蓬勃发展，特别是在泰国和马来西亚。根绝野生动物贸易被认为是该区首要的保护工作。

資料來源：¹Corlett RT, 2007. The impact of hunting on the mammalian fauna of tropical Asian forests. *Biotropica* 39(3): 292-303. ²http://www.the-peninsulaqatar.com/Display_news.asp?section-World_News&subsection-Rest+of+the+World&month=February2007&file-World_News2007_02151574.xml

关键生态系统合作基金批准印支项目

经过数年的筹备和讨论，关键生态系统合作基金 (CEPF) 捐助理事会通过了印支的战略投资计划（也被称为“生态系统投资概要”）。投资概要将提供950万美元的资金，来支持非政府和其他公民社会组织来实现投资概要中认定的保护目标。下一步工作是组建区域性实施机构，为这个热点地区提供战略性领导，培养有广泛代表性的公民社会组织队伍。

資料來源：CEPF 新闻网站 www.cepf.net/xp/cepf/news/newsletter/2007/may07_expansion.xml

虎骨贸易者威胁到残存的野生种群

经营者正在对中国政府施加越来越大的压力，声称买卖人工饲养老虎产品将减少对野生种群的压力，应取消自1993年实施的禁止国内老虎制品贸易的规定。然而，TRAFFIC和世界自然基金会认为，取消禁令会扩大市场需求，从而对野生种群带来灾难性的后果。最近TRAFFIC的调查发现，只有不到3%的中药店声称尚有虎骨出售。但是，以大型猫科动物毛皮制成的服装在西藏成为显示社会地位的标志，需求不断攀升。有3%的城镇居民声称自己拥有虎皮或豹皮的服装，纵使他们都知道这是违法的。作为老虎最后根据地的印度目前正面临著新的偷猎压力。

资料来源：TRAFFIC website, www.traffic.org/RenderPage.action?CategoryId=1776

污染造成山区降水减少

柴油发动机、焚烧秸秆和农业化肥产生的微小悬浮颗粒形成的雾霾天气可能正在减少中国山区的降水量。对华山顶峰过去50年的气象资料的分析证实，由于雾霾的影响，地形降水一由过饱和空气沿山坡上升时形成的降雨一减少了30-50%。随著污染的增加，从1970年到2005年，年平均降水量减少了大约三分之一。这项研究成果对中国和世界各地的水源和生态可能具有重要的意义。

资料来源：Nature, 8 March 2007, www.nature.com/news/2007/070305/full/070305-11.html; Science 315: 1396-1398.

农田变油田

据国家林业局的新闻，为了生产生物柴油，中国计划把麻疯树种植面积（大部份是在南方）从目前的2万平方公里增加到13万平方公里¹。种植地区是云南、四川、广西、广东和海南²的干热河谷地区。在云南，每平方公里的麻疯树林可以生产150吨的生物柴油。中国计划到2020年生物柴油的产量达到2千万吨，仅广西一省就计划产生5百万吨³，需要种植3万平方公里的麻疯树林。一些专家担心，对油的需求特别是来自欧洲的需求，会减少粮食种植面积⁴，连提倡生物柴油的支持者也促请有关当局提出要谨慎行事。四川已经把今后五年的计划产量从10万吨减少至到了5万吨。

资料来源：¹Green Car Congress www.greencarcongress.com/2007/02/china_planning.html; ²Jatropha curcas News www.jatropha.de/news/jcl-news.htm ³Danmex China Business Resource www.danmex.org/spansk/tekst.php?id=238; ⁴Worldwatch Institute www.worldwatch.org/node/4870;

禁止蜂猴的国际贸易

从2007年6月开始，蜂猴所有种都被列入濒危野生动植物种国际贸易公约的附录一¹，因此现时它们的国际贸易已被禁止²。提出这项建议的是柬埔寨，并得到泰国、印度和印度尼西亚以及很多的独立科学家的和议。这项禁令适用于分布在中国的蜂猴和矮蜂猴，它们在中国都被列为濒危动物³，蜂猴在广西可能已经灭绝，而两种在云南

也都濒临灭绝。

资料来源：¹CITES summary record http://www.cites.org/eng/cop/14/rep/E14-Com-I-Rep-07.pdf; ²CITES proposal http://www.cites.org/eng/cop/14/prop/E14-P01.pdf; ³Wang S and Xie Y, 2004. China Species Red List. Higher Education Press, Beijing.

华南鸟类的分类变化

通过分析亚洲画眉科鸟类在形态和声音上的差异，独立出了44个新种。Yuhina torquicola是华南最常见的林鸟，广泛分布在从云南中部、泰国北部到华东的地区，这次从栗耳凤鹛的一个亚种Y. castaniceps torquicola提升到了种的地位。分布在从云南到华东的淡黄色噪鹛Garrulax berthemyi与台湾的棕噪鹛G. poecilorhynchus有差别。海南和老挝的Garrulax castanotis也从褐胸噪鹛海南亚种G. maesi castanotis提升到了种的水平。华东的Pomatorhinus swinhoi也有别于分布在喜马拉雅地区的Pomatorhinus erythrocybus、分布在印度阿萨姆和缅甸的P. maclellandii、分布在印度支那北部和华北的P. gravivox以及分布在台湾的P. erythrocnemis。分布在江西和云南的Garrulax courtoisi与黄腹噪鹛G. galbanus有差别。分布在滇西南和缅甸东北部的Speleaornis reptatus与长尾鹛S. chocolatinus有差别。另外还暂时认定分布在婆罗洲及其附近岛屿的Macronous borneensis与分布在中国和印度支那的纹胸鹛M. gularis有差别。很多差别在种的水平上并不显著，值得进一步研究。这次修改让台湾增加了7个新的特有鸟种。

资料来源：Collar NJ, 2006. A partial revision of the Asian babblers (Timaliidae). Fork tail 22: 85-112. With reference to Clements JF, 2000. Birds of the World: A Checklist. Pica Press.

蚂蚁分类学揭示独特的华南生态系统

华南有不少地点都具有特别的保护价值，因为它们是某些物种在世界上唯一的分布点。蚂蚁分类学的新进展加深了我们对这种关系的了解。提西塔蚁(Pyramica tisiphone)是由香港嘉道理农场暨植物园发现，以前仅知分布于广东古田自然保护区，现在连云南西双版纳也确定了它的踪迹—该地的标本曾被描述为大禹圆鳞蚁(Epitratus

dayui)。Acropyga septemstruma是根据一个采自香港沙螺洞的标本描述，现在被处理为是首先发现于新几内亚的A. oceanica的同物异名。Acropyga guangxiensis以前仅记录于广西花坪自然保护区，现在它被认为与分布在日本、云南和尼泊尔的A. yaeyamensis是同一物种。

命运塔蚁(Pyramica lachesis)现在仍然只分布在广东古田自然保护区，而Strumigenys heteropha只在香港西贡的山寮出现。另外在华南还发现了100多个出现在单一地点的未命名蚂蚁物种²。具有最多“独特”物种的地区包括香港(调查力度比其它地区要大)、广西的岑王老山、大明山、和花坪自然保护区，和海南的鹦哥岭、坝王岭、吊罗山和五指山自然保护区。

资料来源：¹Bolton B, Alpert G, Ward PS and Naskrecki P, 2006. Bolton's Catalogue of Ants of the World, 1758-2005. Harvard University Press. And references therein. ²Published reports and unpublished data of KFBG and J.R. Fellowes.

世界银行尚需划定高保护价值森林

早在2002年世界银行的森林政策¹中就指出该特别保护一些“重点森林”，然而世行现正被指责尚未为甄别“重点森林”制定清晰和透明的程序。而世行在2003年初以后批准的多个森林相关的项目，据报并未有考查是否“重点森林”，如世行提供一亿美元贷款(另外有欧盟一千二百万美元赠款)，由水利部实施的长江/珠江流域恢复项目(2006-2010)，这个项目包括大规模的造林和土地利用规划。

资料来源：¹World Rainforest Movement Bulletin 114, January 2007; ²Forest Peoples Programme; www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2006/06/09/000112742_20060609100446/Rendered/PDF/309821CNoChangjiang

摇摇欲坠：

兽类进化遗产面临威胁

伦敦动物学会下的动物研究所完成了一项评估，通过把进化特徵与世界自然保护联盟的红皮书结合起来，列出最有进化特徵和全球濒危的100种的兽类：EDGE种类(EDGE是“进化特征和全球濒危”英文单词的首字母缩写，



这个缩写本身又是英文单词“边缘”的意思——译注)。¹这个名单显示了预防兽类进化历史丧失的优先物种。²名列首位的是中国的白暨豚，也是这个名单中第一个灭绝的物种。分布在华南的其它的EDGE物种包括亚洲象(第12位)大熊猫(第18位)、小熊猫(第19位)、海南毛猬(第45位)、西南鼯鼠和金佛鼯鼠(并列第72位)。有70%的EDGE物种没有受到充分的保护。伦敦动物学会希望筹集资金，并将精力集中在这些无法取代的物种。

资料来源：¹www.edgeofexistence.org web site, accessed 23 April 2007. ²Isaac NJB, Turvey ST, Waterman C & Baillie JEM, 2007. Mammals on the EDGE: Conservation priorities based on threat and phylogeny. PLoS ONE 2(3): e296. doi: 10.1371/journal.pone.0000296.

广东阳江查获涉嫌走私野生动物801箱

阳江边防支队和阳西县警方于五月二十二日和二十三日在阳西县沙扒查获两大批共八百零一箱野生动物。其中包括国家一级保护动物巨蜥6,340条、

省重点保护动物合龟1,525只、国家二级保护动物穿山甲30只和21只熊掌，总重量达四万多斤。由于涉嫌走私的木船上没有人，这批野生动物来自何方，运向何处，目前仍是一个谜。该支队查获阳江乃至广东省近年最大一宗涉嫌走私野生动物案件，在国内也极为罕见。

资料来源：¹http://news.xinhuanet.com/society/2007-05/24/content_6144986.htm ²http://news.sina.com.cn/c/2007-05-25/024211888160s.shtml ³http://www.guardian.co.uk/china/story/0,,2088589,00.html

中国项目动态

今年中国项目出现了数张新面孔。首先是卢刚，我们驻海南的保育主任，主力协调在当地开展的项目，他曾于海南职业技术学院生物系任教。接著是罗益奎，他专责协助筹划与推行华南地区的环境教育工作，此外，他对香港及华南地区的蝴蝶有丰富的认识。最后要介绍的是来自本园教育部的朱咏贤，她已接任教育及意识推广主任一职。而周嘉旺已到无止桥慈善基金出任行政总干事，她在制定意识推广策略以及为中国保育计划注入教育元

素都有很出色的表现，我们谨此向她致谢并祝福她今后诸事顺利。

嘉道理农场暨植物园 奖学金消息

今年是嘉道理农场暨植物园奖学金设立十周年，过去已有三十三名来自不同院校的研究生获得奖学金，从事有关生物多样性和可持续生活模式的研究。2007年度的嘉道理农场暨植物园奖学金得主报告会将于九月初举行，我们很荣幸得到海南师范大学和海南省林业局野生动植物自然保护中心支持，作为这次活动的合办夥伴。

今年我们共收到18份奖学金申请书，并将于九月七日假海南师范大学进行面试。奖学金得主报告会则紧接在九月八日至九日举行，让得奖的同学们分享过去一年的研究成果，并促进不同学者的沟通交流。各嘉宾和同学将于九月十日前往东寨港国家级自然保护区进行考察。

2007年度嘉道理农场暨植物园奖学金的得奖者名单，稍后将于本园网页http://www.kfbg.org内公布。

Forests seen as salvation from climate change

The importance of forests both in enabling adaptation to climate change, and in reducing greenhouse gas emissions through “avoided deforestation”, was recognised at the 12th session of the Conference of the Parties to the UN Framework Convention on Climate Change, and the 2nd meeting of the Parties to the Kyoto Protocol, in November 2006.¹ An influential document was the UK Government’s Stern Review released in October 2006.² This includes the prevention of further tropical deforestation as a key element of future international climate frameworks, noting that 20% of annual greenhouse-gas emissions now come from deforestation – more than the global transport sector. The Stern Review also concluded that reduced deforestation is a very cheap strategy. The cost, in terms of surrendered utilisation opportunities, is just US\$5-10 billion annually or US\$1-2 per ton of averted

CO₂ emissions: just 1/30 the cost of reducing emissions from fossil fuels. Based on the varying market-value for carbon, intact rainforest could be worth up to US\$8,000/ha.³ The Coalition for Rainforest Nations, an alliance of 33 developing nations led by Papua New Guinea and Costa Rica, has called for international provisions for reduced-deforestation since its formation in 2005.⁴ This proposal has been endorsed by the Association for Tropical Biology and Conservation.⁵

Sources: ¹Center for International Forestry Research, 12 January 2007 www.cifor.cgiar.org/Publications/PoLex/poLexdetail.htm?pid=765; ²UK Stern Review on the Economics of Climate Change www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/stern_review_report.cfm; ³Laurance WF, 2007. A new initiative to use carbon trading for tropical forest conservation. *Biotropica* 39(1): 20-24. ⁴Coalition for Rainforest Nations www.rainforestcoalition.org ⁵*Tropinet* 17 (3): 5. www.atbio.org/tn_v17_n3_Sept_2006.pdf

Climate change: the threat takes shape

Three *Summaries for Policymakers for the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* were released in the first half of 2007. These multi-authored texts, based on broad and sound evidence, give a clearer idea than previous reports of the evidence for and impacts of climate change, and how it might be mitigated.

The summary of Working Group I – *The Physical Science Basis* – was released in February.¹ Key conclusions are:

- Global atmospheric carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O) now far exceed pre-industrial values. CO₂ has increased mainly due to fossil fuel use and land-use change, while CH₄ and N₂O increases are primarily due to agriculture.
- The planet has warmed since 1750, and this is almost certainly (>90% probability) due to human activities.
- Of many probable human impacts on extreme weather events, the most certain are: warmer and fewer cold days and nights over most land areas; warmer and more frequent hot days and nights over most land areas; more frequent warm spells or heat waves over most land areas; and more frequent heavy-rainfall events over most areas.
- The last time the polar regions were significantly warmer than the present for an extended period – about 125,000 years ago – the melting of polar ice raised the sea level by 4-6 metres.
- It is now thought very likely (<90%) that anthropogenic greenhouse gases account for most of the global temperature rise since the mid-20th century.
- A warming of about 0.2°C per decade is now projected, and most scenarios predict continued temperature and sea level increases over centuries, even if greenhouse gases are stabilised.

The summary of Working Group II – *Climate Change Impacts, Adaptation and Vulnerability* – was released in April.² It concludes many natural systems are already being affected by regional climate changes, particularly temperature increases. Anthropogenic warming has impacted many physical and biological systems over the last three decades, though some regional impacts remain difficult to discern due to non-climatic drivers. On future impacts, the summary predicts:

- Annual average river runoff and water availability will increase by 10-40% at high latitudes and in some wet tropical areas, and decrease by 10-30% over some dry regions at mid-latitudes and in the dry tropics. Glacier melt in the Himalayas will lead to decreased river flows. East Asian river basins will face reduced freshwater availability and increased flooding.
- Ecosystems will not have enough resilience to withstand climate change, associated disturbances and other drivers of global change (land use change, pollution, over-exploitation of resources). Net carbon uptake by terrestrial ecosystems is likely to peak before 2050 and then weaken or reverse, thus amplifying climate change.
- Crop productivity at mid to high latitudes will increase slightly for local temperature rises of 1-3°C. In East Asia yields could increase by up to 20%. Crop productivity at lower latitudes and in Central Asia will decrease, exacerbated by increased droughts and flooding. Fisheries will be

adversely affected.

- Coasts will face increasing risks of erosion, and coral mortality will be widespread. Flooding will affect millions of people in the mega-deltas of Asia and Africa.
- Malnutrition will increase, as will health impacts through heatwaves, floods, storms, fires, droughts, diarrhoeal disease, cardio-respiratory diseases, and some infectious diseases. Diarrhoeal disease associated with floods and droughts will increase in East Asia.

It concludes that some climate change is now unavoidable and adaptation essential, particularly in addressing near-term impacts. Unmitigated climate change would, in the long term, be likely to exceed the capacity of natural, managed and human systems to adapt. The annual costs of climate change will increase over time as global temperatures increase.

The summary of Working Group III – *Mitigation* – was released in May. Noting the rise in greenhouse gases (GHGs) (by 70% from 1970 to 2004), and the continued rise to be expected with current policies, the report recognises the substantial economic potential for mitigating GHG emissions. Highest potential emissions savings in the short- to medium-term (before 2030) are expected to be from buildings (~6 gigabytes (Gt) CO₂-equivalent/yr), energy supply (~3 Gt), industry (~3 Gt), agriculture (~3 Gt), forestry (~2 Gt), transport (~2 Gt) and waste (~0.7 Gt).

Forest-related mitigation activities could considerably reduce emissions and increase sequestration at low costs. About 65% of this forest-related mitigation potential is in the tropics, and about 50% could be achieved by reducing emissions from deforestation. Mitigation options could be compatible with adaptation to climate change, and have substantial co-benefits in terms of employment, income generation, biodiversity and watershed conservation, renewable energy supply and poverty alleviation. Policies, measures and instruments in the forestry sector that have been shown effective in mitigating climate change include:

- financial incentives to increase forest area, to reduce deforestation, and to maintain and manage forests; and
- land use regulation and enforcement.

These are constrained by lack of investment capital and by land tenure issues.

Government support through financial contributions, tax credits, standard setting and market creation is important to effective mitigation. It is justified because the main benefits will be public, not private, yet government funding in most energy research has declined worldwide, and is now about half the 1980 level. Besides funding, governments need to provide the right institutional, policy, legal and regulatory frameworks to sustain investment flows and allow effective technology transfer.

Mitigation options have various possible synergies with other dimensions of sustainable development. Reducing habitat loss and deforestation would benefit biodiversity, soil and water conservation as well as reducing GHG emissions. Afforestation and bioenergy plantations can help restore degraded land, manage water runoff, retain soil carbon and benefit rural economies, but could compete with land for food production, and can cause biodiversity loss if badly designed.

Sources: ¹www.ipcc.ch/SPM2feb07.pdf; ²www.ipcc.ch/SPM6avr07.pdf; ³www.ipcc.ch/SPM040507.pdf



China's new responsibility

China is now the world's leading producer of greenhouse gases. In 2006 China produced 6,200 megatonnes (Mt) of carbon dioxide, overtaking the USA which produced 5,800 Mt. Global emissions increased by 2.6% from 2005, largely due to increased coal consumption in China and elsewhere. Of China's 2006 emissions, 9% (550 Mt) came from cement production. North Americans remained the largest per-capita carbon polluters, at 20 tonnes per person, with people in China each producing 3.5 t.

Source: Netherlands Environmental Assessment Agency, June 2007, www.mnp.nl/en/dossiers/Climatechange/moreinfo/Chinaown1InCO2emissionsUSAinseco ndposition.html

IUCN explores ecological compensation in Hainan

The World Conservation Union (IUCN) is working with Chinese experts in Hainan to explore options for policies that support compensation for ecosystem services.¹ The initiative is part of the Canadian International Development Agency's Policy Options Project in China,² and the pilot project focuses on ethnic-minority areas in the interior of Hainan. Participants from the Hainan Department of Land, Environment & Resources and other provincial offices have made two study tours to Canada to learn about this emerging field. The project will help Hainan develop provincial regulations on payments for ecosystem services, giving better incentive for ecosystem conservation.

Source: ¹www.iucn.org/places/canada/news/062808_China_May_Trip.htm; ²www.popinchina.com/index.html

Turtle farms compounding the pressures on wild turtles

China now has over 1,000 turtle farms, in an industry worth over US\$1 billion.¹ As the primary purchasers of wild-caught Asian turtles, they continue to make enormous short-term profits at the expense of turtle populations, most of which are expected to become extinct if current trends continue. The huge, largely unregulated farming industry provides a loophole by which wildlife traders launder illegally collected turtles as "captive-bred." A 2004 survey of 11 turtle farms in Hainan found 33 turtle species being farmed. Wild-caught individuals were held for 31 of these, including *Cistoclemmys flavomarginata* (Endangered: EN), *Cuora trifasciata* (Critically Endangered: CR), *Mauremys mutica* (EN), *Palea steindachneri* (EN) and *Sacalia quadriocellata*

(EN) from China, and species from Indonesia, Vietnam, USA, South America and Europe.

Sources: ¹Shi Haitao, Parham JF, Lau M and Chen Tien-Hsi, 2007. Farming endangered turtles to extinction in China. *Conservation Biology* 21(1): 5-6.

Baiji: a national treasure is lost

The Baiji or Yangtze River Dolphin *Lipotes vexillifer* was declared probably extinct in December 2006, following a comprehensive six-week survey by scientists from six nations, led by the Ministry of Agriculture. The two research vessels covered 3,500 km between the Three Gorges dam and Shanghai, using high-performance optical instruments and underwater microphones, and found no individuals; the last seen was in 2004. It is the first dolphin to be extinct by human action.

The team also surveyed the Critically Endangered Yangtze Finless Porpoise *Neophocaena phocaenoides asiaeorientalis*, finding fewer than 400. According to Wang Ding of the Institute of Hydrobiology Wuhan, their population is like that of the Baiji 20 years ago: small and declining rapidly, with a 7% annual decline.

Sources: baiji.org, www.baiji.org/expeditions/1/0verview.html; tursiops.org <http://tursiops.org/modules.php?name=News&file=article&sid=1911>, March 2007

China urged to take a lead in tropical Asian conservation

In its Kunming Declaration (21 July 2006), The Association for Tropical Biology and Conservation (ATBC) has urged tropical Asian nations to expand their protected-areas systems, support them against illegal and degrading activities, link reserves into regional and cross-national networks, and boost funding for science-based strategies of forest conservation and restoration.¹ ATBC strongly advises policymakers to engage in an active and ongoing dialogue with informed scientists, to better understand the critical challenges facing the region and its vital natural resources. It also urges China, in particular, to take a leading role in promoting, funding and developing more sustainable development strategies and conservation initiatives in tropical Asia. At present much of the timber entering China's commercial markets is stolen and harvested in an environmentally destructive manner.² There is a risk of consumer boycotts in Europe and North America which buy two-thirds of China's furniture and wood exports.

Source: ¹*Tropinet* 17(3): 5 www.atbio.org/tn_v17_

ⁿ³[_n3_Sept_2006.pdf](http://www.atbio.org/tn_v18_n1_jan_2007.pdf); ²*Tropinet* 18(1): 1-2 www.atbio.org/tn_v18_n1_jan_2007.pdf

Yangtze Giant Softshell Turtle: sliding toward extinction

The world's largest freshwater turtle, the Yangtze Giant Softshell *Rafetus swinhoei*, edged closer to extinction when one of five captive individuals died in Shanghai Zoo. The animal was from the Red River basin in Yunnan. Its death leaves three from eastern China, held in Suzhou, Jiangsu, and a lone survivor from the Red River basin, held at Hoak Kiem Lake in Hanoi, Vietnam. In September 2006 an urgent action plan was launched, in which the four (now three) remaining animals in China were to be brought together in Suzhou, and bred in captivity. Meanwhile concerted searches are being conducted in captivity and in the wild (including surveys by Shi Haitao in Guangxi and Guangdong), while programmes of education, research, fundraising and coordination with Vietnam are under way.

Sources: www.asianturtle.org/library/bulletins/ATCN_bulletin_January_2007.html; www.turtlesurvival.org/Rafetus%20Workshop%20Report.pdf; www.asianturtle.org/library/ATCN_news/2006_articles/Action_Plan_for_the_Conservation_of_the_Giant_Yangtze_Softshell_Rafetus_swinhoei.html

CCBA endorses reforestation project in Tengchong, Yunnan

One of the world's first two forestry projects to be certified under the international Climate, Community & Biodiversity (CCB) standards is in Yunnan, China. The reforestation project in Tengchong, just southwest of Gaoligongshan National Nature Reserve, is led by Conservation International and The Nature Conservancy. It is the first Small Scale forestry project validated under the Kyoto Protocol's Clean Development Mechanism. Its successful CCB audit shows it goes beyond the requirements of the Kyoto Protocol and is expected to demonstrate the delivery of environmental and sustainable-development benefits in addition to combating climate change. Almost 5 km² of degraded land will be reforested with native trees (*Taiwania flousiana*, *Betula luminifera*, *Alnus nepalensis* and *Pinus yunnanensis*), which are projected to remove nearly 160,000 tonnes of CO₂ from the atmosphere over 30 years. The auditors recommended that biodiversity impact monitoring would need further adaptation at a later stage; this remains an ill-defined area of the standards administered by the CCB Alliance.

Sources: CCB Standards website: ¹www.climate-sta

ndards.org/news/news_feb2007.html; ²www.climate-standards.org/projects/files/Tengchong_CDM_SSC_AR_PDD_final.pdf; ³www.climate-standards.org/projects/files/Validation_Report_Tengchong%20CCBA_30.1.07_incl%20Annex.pdf

Guangxi Integrated Forestry Development and Conservation Project

A US\$100 million World Bank project has been approved to develop and protect China's forests. The intention is to help China improve the effectiveness of its forest management and institutional arrangements in timber production, watershed protection, and nature-reserve management, and to enhance conservation of globally significant biodiversity in selected areas. An additional \$5 million from the Global Environment Facility will finance and implement management plans to strengthen collaboration between nature reserves and local communities.

Source: China View, in www.recoftc.org/site/fileadmin/docs/e-letter2006/Community_Forestry_E-news_2006_30Dec06.html#w

SFA halts APP takeover of Yunnan timber company

The State Forestry Administration (SFA) has held up a merger and acquisition plan by Asian Pulp & Paper Co. (APP) to buy 58% shares of a State-owned timber company in Yunnan. SFA has asked the provincial government to carry out a thorough valuation before deciding on the plan, which involved the transfer of 670 km² of State-owned forest. SFA also ordered China's 14 regional forest resource management offices to crack down on illegal logging. During 2007 the Administration will complete a new national forestry development and afforestation plan, including development schemes for various forest types.

Source: China Daily 8 Feb 2007, www.chinadaily.com.cn/china/2007-02/08/content_803968.htm

Background refs: www.illegal-logging.info/papers/APP_Hainan_Project.pdf www.eepsea.org/ev.php?ID=8403_201&ID2=DO_TOPIC

Rampant trade impacts tropical Asia's forest ecology

A historical review of hunting in Asia shows how hunting for subsistence, which has occurred for at least 40,000 years, has been outweighed in the last 50 years by hunting for trade, which threatens many additional species.¹ This has impacts on ecological processes within forests. Many dispersers of large seeds, and understory browsers, have been depleted or eliminated, while impacts on seed predators have been

variable. Carnivores too are widely threatened; following the decline of the *Tiger Panthera tigris*, Clouded Leopard *Neofelis nebulosa* parts are being used in Chinese medicine in place of tiger parts, driving the smaller cat toward extinction throughout Indochina.² Attempts to prosecute smugglers in Indochina have suffered from intimidation and legal mistakes. Dealers now run packaging operations in Malaysia to save the trouble of live transport; pangolins are butchered and vacuum-sealed for shipment to China. Freshwater turtles are ground up in Indonesia for export as protein and medicine. The exotic pet market is also growing, especially in Thailand and Malaysia. Ending the wild animal trade is accorded the highest conservation priority in the region.¹

Sources: ¹Corlett RT, 2007. The impact of hunting on the mammalian fauna of tropical Asian forests. *Biotropica* 39(3): 292-303. ²http://www.thepeninsulaqatar.com/Display_news.asp?section=World_News&subsection=Rest+of+the+World&month=February2007&file=World_News200702151574.xml

CEPF approval for Indochina

After some years of preparation and discussion, the strategic investment plan (or "ecosystem profile") for Indochina, part of the Indo-Burma biodiversity hotspot, has received approval by the Critical Ecosystem Partnership Fund (CEPF) Donor Council. The decision frees up US\$9.5 million for nongovernmental and other civil society groups working toward the conservation goals identified in the profile. The next step will be to recruit a regional implementation team, to provide strategic leadership in the hotspot, building a broad constituency of civil society groups.

Source: CEPF News website www.cepf.net/xp/cepf/news/newsletter/2007/may07_expansion.xml

Tiger traders threaten last wild populations

Traders are putting increasing pressure on the China Government to ease the 1993 domestic trade ban on *Tiger Panthera tigris* parts, arguing that trade in captive-bred tigers would take the pressure off wild populations. But according to TRAFFIC and World Wide Fund for Nature (WWF), removing the ban would be disastrous for wild tigers, since it would expand the market. Recent TRAFFIC surveys have found less than 3% of Chinese medicine shops claiming to stock tiger bone. But demand for big cat skins as status symbol clothing is escalating in Tibet, where 3% of urban people claim to own tiger-or leopard-skin garments despite knowing it is illegal. Tigers in their last stronghold, India, face renewed poaching

pressure.

Source: TRAFFIC website, www.traffic.org/RenderPage.action?CategoryId=1776

Pollution is decreasing mountain rainfall

Hazy conditions caused by small aerosols, such as particles from diesel engines, biomass burning and agricultural fertilizers, may be reducing mountain rainfall in China. A study on 50 years of climate data from the summit of Huashan, central China, concludes that orographic precipitation – caused by supersaturation of air forced upwards by a mountain range – decreased by 30-50% in hazy conditions. Annual precipitation fell by about a third from 1970 to 2005, as pollution rose. The findings could have major implications for water supplies and ecology in China and elsewhere.

Sources: *Nature*, 8 March 2007, www.nature.com/news/2007/070305/full/070305-11.html; *Science* 315: 1396-1398.

Land converting to fuel oil

According to the SFA, China plans to plant 130,000 km², mainly in the south of the country, with plantations of *Jatropha curcas* trees for biodiesel, up from the 20,000 km² currently growing.¹ The species is grown in hot dry valley areas in Yunnan, Sichuan, Guangxi, Guangdong and Hainan.² *Jatropha curcas* plantations in Yunnan can produce 150 tonnes of biodiesel per km², and China has plans to produce 20 megatonnes by 2020. Guangxi alone aims to produce 5 Mt,³ which would require over 30,000 km² of land. Some experts have raised concerns that oil demand, especially from Europe, will lead to shrinkage of food production,⁴ and even biodiesel advocates urge caution. Sichuan has scaled down its plans for the next five years from 100,000 to 50,000 t.

Sources: ¹Green Car Congress www.greencarcongress.com/2007/02/china_planning_.html; ²*Jatropha curcas* News www.jatropha.de/news/jcl-news.htm ³Danmex China Business Resource www.danmex.org/spansk/tekst.php?id=238; ⁴Worldwatch Institute www.worldwatch.org/node/4870;

International Slow Loris trade is banned

In June 2007 all slow lorises *Nycticebus* spp. were transferred to Appendix I of the Convention on International Trade in Endangered Species (CITES).¹ International trade in these animals is now banned. The move follows a proposal by Cambodia and support by Thailand, India and Indonesia as well as many independent scientists.² The ban applies to China's Northern Slow Loris *N. bengalensis*



and Pygmy Loris *N. pygmaeus*, both considered Endangered nationally;³ the former may be extirpated in Guangxi and both are close to extinction in Yunnan. Also covered is the Sunda Slow Loris *N. coucang*.

Sources: ¹CITES summary record <http://www.cites.org/eng/cop/14/rep/E14-Com-I-Rep-07.pdf>; ²CITES proposal <http://www.cites.org/eng/cop/14/prop/E14-P01.pdf>; ³Wang S and Xie Y, 2004. *China Species Red List*. Higher Education Press, Beijing.

Taxonomic changes to South China birds

A review of diagnostic features of Asian babblers (Timalidae), based on a grading of morphological and vocal differences, results in the separation of 44 species not previously recognised at the species level. Indochinese Yuhina *Yuhina torqueola*, one of South China's most abundant forest birds, occurs from central Yunnan and north Thailand to eastern China and is now upgraded from a subspecies of Striated Yuhina *Y. castaniceps*. *Garrulax berthemyi* (Buffy Laughingthrush), occurring from Yunnan to east China, is distinct from *G. poecilorhynchus* (Rusty Laughingthrush) in Taiwan. Rufous-cheeked Laughingthrush *Garrulax castanotis* from Hainan and Laos is distinguished from Grey Laughingthrush *G. maesi*. *Pomatorhinus swinhoi* (Grey-sided Scimitar Babbler) in east China is distinct from *P. erythrognys* (Rusty-cheeked Scimitar Babbler) in the Himalayan region, *P. maclellandii* (Spot-breasted Scimitar Babbler) in Assam and Myanmar, *P. gravivox* (Black-streaked Scimitar Babbler) from northern Indochina to northern China and *P. erythrocnemis* (Black-necklaced Scimitar Babbler) in Taiwan. *Garrulax courtoisi* (Blue-crowned Laughingthrush) from Jiangxi and Yunnan is distinct from *G. galbanus* (Yellow-throated Laughingthrush). *Spelaornis reptatus* (Grey-bellied Wren Babbler) in southwest Yunnan and northeast Myanmar is distinct from *S. chocolatinus* (Long-tailed Wren Babbler). *Macronous borneensis* (Bold-striped Tit Babbler) from Borneo and adjacent islands is provisionally considered separate from *M. gularis* (now called Pin-striped Tit Babbler) in China and Indochina. Many of these distinctions are marginal at the species level, and merit further study. By this revision Taiwan gains seven new endemic species.

Sources: Collar NJ, 2006. A partial revision of the Asian babblers (Timaliidae). *Forktail* 22: 85-112. With reference to Clements JF, 2000. *Birds of the World: A Checklist*. Pica Press.

Ant taxonomy throws light on unique South China ecosystems

A number of sites in South China are of special conservation importance as the only sites in the world from which a particular species is known. New developments in ant taxonomy improve our understanding of some of these.¹ *Pyramica tispiphone*, previously known only from Gutian Nature Reserve (NR) in Guangdong where it was discovered by KFBG, is now also known from Xishuangbanna in Yunnan, where it was first described as *Epitritus dayui*. *Acropyga septemstruma*, described from a single specimen from Shalotung, Hong Kong, is now a junior synonym of *Acropyga oceanica*, first described from New Guinea. *Acropyga guangxiensis*, known only from Huaping NR, Guangxi, has been synonymised with *A. yaeyamensis* from Japan, Yunnan and Nepal.

Pyramica lachesis is still known only from Gutian NR, while *Strumigenys heteropha* is known only from Shan Liu near Sai Kung, Hong Kong. An additional 100 unnamed ant species are known from single sites in South China.² Sites with the highest number of "uniques" include: Hong Kong (more intensively surveyed than other areas); Guangxi's Cenwanglaoshan, Damingshan and Huaping NRs; and Hainan's Yinggeling, Bawangling, Diaoluoshan and Wuzhishan NRs.

Sources: ¹Bolton B, Alpert G, Ward PS and Naskrecki P, 2006. *Bolton's Catalogue of Ants of the World, 1758-2005*. Harvard University Press. And references therein. ²Published reports and unpublished data of KFBG and J.R. Fellowes.

World Bank yet to define forests of high conservation value

The World Bank (WB) has been criticised over its lack of a clear and transparent process for defining 'critical forests', which were to be expressly protected in its 2002 Forests Policy.¹ Many of the WB's forest-related projects approved since early 2003 have reportedly not been screened for 'critical forests' at all. An example is the Changjiang/Pearl River Watershed Rehabilitation Project (2006-2012), implemented by the Ministry of Water Resources with a \$100 million WB loan (with a \$12 million grant from the EU), which involves extensive afforestation and land use planning.²

Sources: ¹World Rainforest Movement Bulletin 114, January 2007; ²Forest Peoples Programme; www.wds.worldbank.org/external/default/WDSContentServer/WDS/IB/2006/06/09/000112742_20060609100446/Rendered/PDF/309821CNoChangjiang

Species on the EDGE: mammalian evolutionary heritage at risk

The Institute of Zoology of the Zoological Society of London (ZSL) has combined an assessment of evolutionary distinctiveness with the IUCN Red List to rank the 100 mammal species which are most Evolutionary Distinct and Globally Endangered: EDGE species.¹ This reflects priorities in preventing the loss of mammalian evolutionary history.² Top of the list is China's Baiji *Lipotes vexillifer* – sadly the first on the list to be extinct (see above). Other EDGE species in southern China are Asian Elephant *Elephas maximus* (ranked 12th), Giant Panda *Ailuropoda melanoleuca* (18th), Red Panda *Ailurus fulgens* (19th), Hainan Gymnure *Hylomys hainanensis* (45th), Inquisitive Shrew-mole *Uropsilus investigator* and Chinese Shrew-mole *Uropsilus soricipes* (joint 72nd). 70% of EDGE species are currently receiving no substantial conservation effort; ZSL hopes to raise funds and focus efforts on these irreplaceable species.

Sources: ¹www.edgeofexistence.org website, accessed 23 April 2007. ²Isaac NJB, Turvey ST, Waterman C & Baillie JEM, 2007. Mammals on the EDGE: Conservation priorities based on threat and phylogeny. *PLoS ONE* 2(3): e296. doi: 10.1371/journal.pone.0000296.

Large confiscation in Guangdong

In May police in Yangjiang, Guangdong, discovered two cases of wild animal smuggling. The 801 crates seized contained some 40 tonnes of animals, including 6,340 monitor lizards, 30 pangolins, 1,525 box turtles and 21 bear paws. Many of the species are under Class I or II national protection in China. They are Guangdong's largest confiscation in recent years, but the animals' origin remained a mystery as the smugglers escaped arrest.

Sources: ¹http://news.xinhuanet.com/society/2007-05/24/content_6144986.htm ²<http://news.sina.com.cn/c/2007-05-25/024211888160s.shtml> ³<http://www.guardian.co.uk/china/story/0,,2088589,00.html>

China Programme changes

We are delighted to have a couple of new faces on our staff this year. We have Lu Gang, formerly a lecturer teaching biological courses in Hainan Vocational and Technical College; he is currently working as our consultant stationed in Hainan to coordinate local projects. Philip Lo is another newcomer, whose main focus is developing and implementing environmental education programmes in South China. He has a wealth of knowledge of butterflies in Hong Kong and South China. Last but not least, Wylie Chu, experienced in organizing a wide range of educational programmes, transferred from KFBG's Education Department to take up the education

and public awareness role previously performed by Sharon Chow, who is now the Chief Executive Officer of WuZhiqiao (Bridge to China) Charitable Foundation. We thank her for all her excellent work in refining our public awareness strategy and incorporate education components in China conservation projects, and wish her the best of luck in her future endeavours.

KFBG Studentship news

This year marks the Tenth Anniversary of these annual awards, and we have supported 33 students engaged in the study of biodiversity and sustainable living. We are honoured to have Hainan Normal University and Hainan Wildlife

Conservation Centre of Hainan Forestry Department as our co-organisers of the 2007 Studentship meeting, which will be conducted soon.

There are 18 applications, and the candidates will be interviewed on 7 September at Hainan Normal University. On the following two days the current studentship holders will present their progress reports to facilitate the exchange of views and information. Guests, current studentship holders and this year's applicants are invited to join a day trip to Dongzhaigang National Nature Reserve on 10 September.

The results will soon be announced on our website <http://www.kfbg.org>.

森林与生物多样性保育相关的近期出版物

A selection of recent publications of relevance to forest and biodiversity conservation

- Bain RH and Stuart BL, 2006. Significant new records of the Junlian Odorous Frog, *Odorrana junlianensis* Huang, Fei and Ye, 2001. *Hamadryad* 30(1&2): 151-156.
- Bao Maohong, 2006. The evolution of environmental policy and its impact in the People's Republic of China. *Conservation and Society* 4(1): 36-54. www.conservationandsociety.org/cs_4_1_36-54.pdf
- Chan C, 2006. Preliminary results of bat-box trial project in the Hong Kong Wetland Park. *Hong Kong Biodiversity* 13: 13-14 www.afcd.gov.hk/english/publications/publications_con/files/hkbonewsletter13.pdf (附中文摘要)
- Chan SKF, Cheung KS, Ho CY, Lam FN and Tang WZ, 2006. The geckos of Hong Kong. *Hong Kong Biodiversity* 13: 1-9. www.afcd.gov.hk/english/publications/publications_con/files/hkbonewsletter13.pdf (附中文摘要)
- Chen B and Chen GQ, 2007. Resource analysis of the Chinese society 1980-2002 based on energy — Part 2: Renewable energy sources and forest. *Energy Policy* 35: 2051-2064.
- Chen B and Chen GQ, 2007. Resource analysis of the Chinese society 1980-2002 based on energy — Part 3: Agricultural products. *Energy Policy* 35: 2065-2078.
- Chen Jie, 2007. Rapid urbanization in China: A real challenge to soil protection and food security. *Catena* 69: 1-15.
- Chou WH, Lau MWN and Chan BPL, 2007. A new treefrog of the genus *Rhacophorus* (Anura: Rhacophoridae) from Hainan Island, China. *The Raffles Bulletin of Zoology* 55(1): 157-165.
- Chung KPS and Corlett RT, 2006. Rodent diversity in a highly degraded tropical landscape: Hong Kong, South China. *Biodiversity and Conservation* 15: 4521-4532.

在香港发现的 10 种啮齿动物种中，有 7 种被视为外来物种。在过去的毁林过程中，很多种本地森林中的啮齿动物已经灭绝，所带来的生态结果可能是，由整体的种子传播转向为种子消耗。

Of ten rodent species in Hong Kong, seven are considered alien; many native forest rodents are thought to have been extirpated during past deforestation. The ecological result is probably a shift in the balance from seed dispersal towards seed predation.

- Davies EGR and Wismer SK, 2007. Sustainable forestry and local people: the case of Hainan's Li minority. *Human Ecology* 35: 415-426.

一项调查得出结论，海南尚没有在林业上协调好社会福利、环境和经济。作者建议，在有关林业的决策中要包括黎族社群，以减少冲突，把林业建立在可持续的基础之上。

A survey concludes that Hainan has not yet been able to balance social welfare and environmental and economic issues in forestry. The authors recommend including Li communities in forestry-related decisions, to reduce tensions and make forestry more sustainable.

- Dieterle G, Griffiths J and Maginnis S, 2006. Dialogue on Intensively Managed Planted Forests in China, 3-6 April 2006 — Zhanjiang and Beihai, China: co-chairs' summary report. www.wbcsd.org/web/projects/forestry/dialogue-april2006.pdf



- Ding Jianqing, Reardon R, Wu Yun, Zheng Hao and Fu Weidong, 2006. Biological control of invasive plants through collaboration between China and the United States of America: A perspective. *Biological Invasions* 8: 1439-1450.
- 董仕勇, 2007. 海南岛鹦歌岭的蕨类植物。 *云南植物学报* 29(3): 277-285 (附英文摘要)
Dong Shi-yong, 2007. The pteriphyte flora of Yinggeling Nature Reserve, Hainan Island, China. *Acta Botanica Yunnanica* 29(3): 277-285. (In Chinese with English abstract)
在鹦歌岭进行的一项详细调查发现, 该地区有蕨类植物 282 种, 占海南蕨类植物的 63%, 其中 56 种在世界红色名录中被列为受威胁物种。
A detailed fern inventory of Yinggeling finds 282 species: 63% of the Hainan fern flora. Some 56 species are considered Threatened in the global Red List.
- Fan PF, Jiang XL, Liu CM and Luo WS, 2006. Polygynous mating system and behavioural reason of black crested gibbon (*Nomascus concolor jingdongensis*) at Dazhaizi, Mt. Wuliang, Yunnan, China. *Zoological Research* 27: 216-220. (In Chinese with English abstract)
- Fan Pengfei, Liu Changming, Luo Wenshou and Jiang Xuelong, 2007. Can a group elicit duets from its neighbours? A field study on the Black-crested Gibbon (*Nomascus concolor jingdongensis*) in central Yunnan, China. *Folia Primatologica* 78: 186-195.
- Fan Xiaoling, Wang Min and Zeng Ling, 2007. The genus *Idmon* de Niceville (Lepidoptera: Hesperidae) from China, with description of two new species. *Zootaxa* 1510: 57-62.
描述了两种分别采自海南鹦歌岭和广东南岭的弄蝶新种。
New skippers are described from Yinggeling (Hainan) and Nanling (Guangdong).
- Fu Cuizhang, Wang Jingxian, Pu Zhichao, Zhang Shenli, Chen Huili, Zhao Bing, Chen Jiakuan and Wu Jihua, 2007. Elevational gradients of diversity for lizards and snakes in the Hengduan Mountains, China. *Biodiversity and Conservation* 16: 707-726.
- Gauthier-Clerc M, Lebarbenchon C and Thomas F, 2007. Recent expansion of highly pathogenic avian influenza H5N1: a critical review. *Ibis* 149(2): 202-214.
H5N1 高致病性禽流感从中国东南部传播到亚洲、非洲和欧洲, 野生鸟类 (特别是水禽) 被指是加剧了蔓延的源头。对已有证据的分析却表明, 禽流感病毒在全球扩散其实是通过家禽贸易的, 野生鸟类只会引起地区性传播。
The H5N1 bird flu virus spread through Asia, Africa and Europe from southeast China, and wild birds (particularly waterfowl) have been implicated in its spread. A review of evidence shows that global dispersal of the virus has occurred through the human trade in poultry; wild birds have caused only local spread.
- He Fen-qi, Fellowes JR, Chan BPL, Lau MWN, Lin JS and Lee KS, 2007. An update on the distribution of White-eared Night Heron *Gorsachius magnificus* in China. *Bird Conservation International* 17: 93-101.
- Humphreys D, 2006. *Logjam: Deforestation and the Crisis of Global Governance*. Earthscan, London, UK.
- Jim CY and Chen WY, 2007. Consumption preferences and environmental externalities: A hedonic analysis of the housing market in Guangzhou. *Geoforum* 38: 414-431.
据广州的一项研究结果, 购房者特别看重楼房外环境的质量, 例如宽敞的绿化空间、毗邻公园、绿化和水体的风景。这项结果表明, 投资进行都市绿化和自然保护是有回报的。
In a study in Guangzhou, home-buyers were found to place a high value on good outdoor environment, including green space provision, proximity to parks, and views of green space and water. The results justify funding for urban green spaces and nature conservation.
- Lee WH, Wong EYH, Choa GKL and Lai PCC, 2007. Review of egrettries in Hong Kong. *Hong Kong Biodiversity* 14: 1-6. www.afcd.gov.hk/english/publications/publications_con/files/IssueNo14.pdf (附中文摘要)
- Li G, Liang B, Wang YN, Zhao HB, Helgen K, Lin LK, Jones G and Zhang SY, 2007. Echolocation calls, diet and phylogenetic relationship of Stoliczka's trident bat *Aselliscus stoliczkanus* (Hipposideridae). *Journal of Mammalogy*
- Li J, Ge XJ, Cao HL and Ye WH, 2007. Chloroplast DNA diversity in *Castanopsis hystrix* populations in south China. *Forest Ecology and Management* 243: 94-101.
一项遗传研究显示, 一种在中国广泛分布的壳斗科植物—红椎 (*Castanopsis hystrix*) 具有 14 个单倍型, 暗示该物种在最后一次冰河时期过后, 从数量众多而分散的庇护地向外扩散。
A genetic study of a widespread Fagaceae species in China revealed 14 different haplotypes. Results suggest migration from numerous and scattered refugia to which the species was confined during the last glacial period.
- Li MS, Luo YP and Su ZY, 2007. Heavy metal concentrations in soils and plant accumulation in a restored manganese mineland in Guangxi, South China. *Environmental Pollution* 147: 168-175.
一项研究发现, 在中国一个矿山恢复场地上种植的板栗和甘蔗不适于人类食用。作者作出结论, 在矿山恢复地上发展农业的做法值得商榷。

近期出版物

Recent Publications

A study found the Chinese Chestnut and Sugarcane cultivated on a reclaimed mineland were not safe for human consumption. The authors conclude the practice of agricultural restoration on mines should be reconsidered.

- Li ZP, Han FX, Su Y, Zhang TL, Sun B, Monts DL and Plodinec MJ, 2007. Assessment of soil organic and carbonate carbon storage in China. *Geoderma* 138: 119-126.

中国土壤中炭的储存量估计为3820亿吨，超过地表森林生物量中所储藏的炭。在土壤储存量中，有1480亿吨是有机炭，2340亿吨是碳酸盐。中国的土壤管理在全球碳循环中将起着重要的作用。

China's estimated total carbon storage in soil is 382 Pg (=382 billion tonnes), more than the amount stored in aboveground forest mass. Of this 148 Pg is organic, and 234 Pg is in carbonate. Management practices of soils in China will play an important role in global carbon cycles.

- Li Zhaoyuan and Rogers ME, 2006. Food items consumed by White-headed Langurs in Fusui, China. *International Journal of Primatology* 27: 1551-1567.
- Liu Can, Wang Sen, Zhang Wei and Liang Dan, 2007. Compensation for forest ecological services in China. *Forestry Studies in China* 9: 68-79.
- Lopez-Pujol J, Zhang Fumin and Ge Song, 2006. Plant biodiversity in China: richly varied, endangered, and in need of conservation. *Biodiversity and Conservation* 15: 3983-4026.
- Ma Xiangqing, Heal KV, Liu Ai Qin and Jarvis PG, 2007. Nutrient cycling and distribution in different-aged plantations of Chinese fir in southern China. *Forest Ecology and Management* 243: 61-74.

研究发现，在不同年龄的杉木林中（树龄分别是8、14和24年），土壤中的营养物质产出都超过了投入，但随著杉木林的生长，土壤中氮、磷和钙的净损失量也在增加。营养物质循环中的限制环节是幼林中枯枝落叶的分解，以及老龄林中树冠的变化。较老杉木林中营养物质的利用效率更高，从枯枝落叶中释放出的营养物质也更多。随著树龄的增加，生物过程逐渐在营养物质循环中占据主导地位。如果把杉木林的采伐周期延长5年，可以帮助维持土壤中营养物质的水平，有利于下一周期的林木生长。

Nutrient outputs from the soil were found to exceed inputs in *Cunninghamia lanceolata* plantations of all ages (8, 14 and 24 years old), but net soil loss of nitrogen, phosphorus and calcium increased with plantation age. Limiting stages in nutrient cycling were litter decomposition in young plantation, and canopy fluxes in older ones. Older plantations showed more efficient nutrients use, and greater release of nutrients from litter. As stand age increases, biological processes increasingly dominate nutrient cycling. Prolonging the rotation length of Chinese Fir plantations by 5 years could help maintain soil nutrient status for successive plantings.

- Parr J, 2006. establishing specialized management units within Protected Areas for effective Protected Area management. *Tigerpaper* 33(2): 6-10.

建议在泰国的每个国家公园里设立7个专职管理部门：生物资源（来收集、核对和分发关于动植物和生物学的资料）；社区工作（与当地社区联系，收集自然资源利用方面的信息）；执法单位（协调巡护，记录对栖息地和物种的干扰，以及具有生物学意义的观察）；自然资源管理（进行造林和护林防火）；宣传教育（为游客提供高质量的公共服务如展览、自然步道、解说以及专门的服务）；建造及维修；财务和行政。

Recommends establishing seven specialised management units for each national park in Thailand: Biological Resources (to obtain, collate and disperse information on the biota and biological research); Community Outreach (to interact with local communities and collate information on natural-resource harvesting); Law Enforcement (to coordinate patrols, recording habitat and species disturbances as well as observations of biological significance); Natural Resources Management (to conduct reforestation interventions and prevent fire); Nature Education & Outreach (to provide quality public services to visitors: exhibitions, nature trails, interpretation and specialised services); Construction & Maintenance; and Finance & Administration.

- Pearson T, Walker S and Brown S, 2006. *Guidebook for the Formulation of Afforestation and Reforestation Projects under the Clean Development Mechanism*. ITTO, Yokohama, Japan.
- Qiu Renhui, Chen Han and Zhuo Lixin, 2006. Effects of selection cutting on the forest structure and species diversity of evergreen broad-leaved forest in northern Fujian, southern China. *Forestry Studies in China* 8: 16-20.
- Quartel S, Kroon A, Augustinus PGEF, Van Santen P and Tri NH, 2007. Wave attenuation in coastal mangroves in the Red River Delta, Vietnam. *Journal of Asian Earth Sciences* 29: 576-584.
- Ren Hai, Li Zhian, Shen Weijun, Yu Zuoyue, Peng Shaolin, Liao Chonghui, Ding Mingmao and Wu Jianguo, 2007. Changes in biodiversity and ecosystem function during the restoration of a tropical forest in south China. *Science in China Series C: Life Sciences* 50: 277-284.

从1959年开始在广东沿海小良高度退化的土地上进行了长期的恢复试验。作为对照的一个裸露地段经过45年后仍然是没有植被。在试验地段，人工种植的马尾松林在开始的几年生长良好，但因为虫害和气候炎热在1964年死掉。人工种植的桉树林最终立木密度降低，为阔叶林的生长提供了空间。在1964和1975年期间将另外一片桉树林改造成了混交林，同没有经过改造的桉树纯林相比，混交林内鸟类和小型兽类的种类大大增加，昆虫的科更多，土壤动物生物量增加。清除桉树



纯林内的枯枝落叶会增加土壤水分的丧失，抑制当地植物种类的生长。在生物多样性达到一定的水平后，自然恢复过程才能开始运作。

Highly degraded land in Xiaoliang, coastal Guangdong, was subjected to a long-term restoration experiment from 1959. A barren-land control catchment remained denuded after 45 years. A *Pinus massoniana* pine plantation grew well for a few years but died out in 1964 under insect attack and heat stress. A *Eucalyptus exserta* plantation eventually declined in tree density, allowing broadleaf forest to grow. A second eucalyptus plantation converted to mixed forest between 1964 and 1975 gave rise to a diverse ecosystem with more species of bird and small mammal, more families of insects, and greater soil animal biomass than the unmodified eucalyptus plantation. Removal of litter in the monoculture increased loss of soil moisture and prevented native species establishment. A critical level of biodiversity was needed to allow natural recovery processes to take over.

- Shek CT and Lau CTY, 2006. Echolocation calls of five horseshoe bats of Hong Kong. *Hong Kong Biodiversity* 14: 9-12. www.afcd.gov.hk/english/publications/publications_con/files/hkbnewsletter13.pdf (附中文摘要)
- Shi Peijun, Yuan Yi, Zheng Jing, Wang Jingai, Ge Yi and Qiu Guoyu, 2007. The effect of land use/ cover change on surface runoff in Shenzhen region, China. *Catena* 69: 31-35.

模型显示，都市化在很大程度上加剧了深圳的洪水危害。在过去 20 年间，最大洪水流量平均增加了 13%。

Modelling showed that urbanisation has played an important role in intensifying the flood process in Shenzhen. Maximum flood discharge has increased 13% on average in the past 20 years.

- Tang Zhanhui, Cao Min, Sheng Lianxi, Ma Xunfeng, Walsh A and Zhang Shuyi, 2007. Seed dispersal of *Morus macroura* (Moraceae) by two frugivorous bats in Xishuangbanna, SW China. *Biotropica (Online Early Articles)* doi 10.1111/j.1744-7429.2007.00307.x
- Tang ZH, Liang B, Cao M, Sheng LX, Corlett R and Zhang SY, 2007. Effect of ingestion by two frugivorous bats on the seed germination of *Ficus racemosa* and *F. hispida* (Moraceae). *Journal of Tropical Ecology* 23: 125-127.
- Tian Xiang Yue, Ze Meng Fan and Ji Yuan Liu, 2006. Scenarios of land cover in China. *Global and Planetary Change* 55(4): 317-342.
- Tong Yanfeng and Li Shuqiang, 2006. First records of the family Ochyroceratidae (Arachnida: Araneae) from China, with descriptions of a new genus and eight new species. *The Raffles Bulletin of Zoology* 55: 63-76.
- Verburg PH and Veldkamp A, 2001. The role of spatially explicit models in land-use change research: A case study for cropping patterns in China. *Agriculture, Ecosystems and Environment* 85: 177-190.
- Wang Lanhui and Tian Shurong, 2007. Productivity analysis in nature reserve: A case study in Hunan Province. *Forestry Studies in China* 9: 80-84.
- Wang Wei, Potts R, Yuan Baoyin, Huang Weiwen, Cheng Hai, Edwards RL and Ditchfield P, 2007. Sequence of mammalian fossils, including hominoid teeth, from the Bubing Basin caves, South China. *Journal of Human Evolution* 52: 370-379.

在广西西部对年龄介于晚上新世（距今约 2 百万年）到全新世（距今不到 1 万年）之间的洞穴进行了研究。初步结果表明，在地质历史上动物区系随著时间表现出相当大的变化，长期以来作为更新世华南动物区系代表的“剑齿虎/大熊猫动物群”可能是过于简单了。溶岩洞穴内部的挖掘会帮助揭示出与气候变化、生物地理事件和演化有关的动物区系的变化。

Caves studied in west Guangxi span the period from the late Pliocene (~2 million years before present) to the Holocene (<10,000 yrs before present). Initial results suggest considerable change over time, and that the “Stegodon/Ailuropoda [Giant Panda] Fauna” category, long used to characterise the South China Pleistocene faunas, may be an oversimplification. Excavation of karst caves may help reveal faunal variations in relation to climate change, biogeographic events and evolutionary change.

- Weir J and Corlett RT, 2007. How far do birds disperse seeds in the degraded tropical landscape of Hong Kong, China? *Landscape Ecology* 22: 13-14.
- Xie Feng, Lau MWN, Stuart SN, Chanson JS, Cox NA and Fischman DL, 2007. Conservation needs of amphibians in China: A review. *Science in China Series C: Life Sciences* 50: 265-276.

中国在世界两栖类保护中具有重要意义。横断山脉、南岭和武夷山的两栖类种类特别丰富。面临严重威胁的科有铃蟾科、隐腮鲵科、小鲵科和蝾螈科——蝾螈一般比蛙类和蟾蜍更濒危。象世界各地一样，在溪流里繁殖而且分布在高海拔森林里的两栖类面临著更严重的威胁。两栖类面临主要的威胁是栖息地丧失、污染和过度利用。

China is shown to be a global priority for amphibian conservation. The Hengduan, Nanling and Wuyi mountains are exceptionally rich in amphibian species. Families showing a high propensity to become seriously threatened are Bombinatoridae, Cryptobranchidae, Hynobiidae and Salamandridae: salamanders are generally more threatened than frogs and toads. Stream-breeding, high-elevation forest amphibians are much more likely to be seriously threatened, as elsewhere. The most serious threats are habitat loss, pollution and over-harvesting.

- Xu Haigen, Ding Hui, Li Mingyan, Qiang Sheng, Guo Jianying, Han Zhengmin, Huang Zongguo, Sun Hongying, He Shunping, Wu Hairong and Wan Fanghao, 2006. The distribution and economic losses of alien species invasion to China. *Biological Invasions* 8: 1495-1500.

近期出版物

Recent Publications

对中国已知的 283 个外来入侵物种（19 种微生物、188 种植物和 76 种动物）的分析显示，有 55% 的外来入侵物种来自美洲，22% 来自欧洲，10% 来自亚洲，8% 来自非洲。到目前为止，外来物种造成的经济损失达 140 亿美元，其中 83% 属于因生态系统服务丧失而带来的间接损失。

A review of China's 283 known alien invasive species (19 microbes, 188 plants and 76 animals) finds 55% originated in the Americas, 22% in Europe, 10% in Asia and 8% in Africa. Estimated economic losses to alien invasives are over US\$14 billion to date, of which 83% is indirect losses in ecosystem service functions.

- Xu Jianchu and Melick DR, 2007. Rethinking the effectiveness of public protected areas in southwestern China. *Conservation Biology* 21: 318-328.

减低中国自然保护区的管理有效性的原因有：部门间的冲突，缺乏日常性经费和技术支持，保护和创收之间的混淆，含糊的科学定义，社区对政策不信任，模糊的使用权和土地权属。中国西南的土著居民显示出，当地的生产生活可以促进长远的保护。作者认为，应该支持土著居民正在进行的对自然地区的可持续利用，而不是新建更多的自然保护区。

The effectiveness of protected areas in China is found to be compromised by institutional conflicts, lack of ongoing financial and technical support, confusion between the objectives of generating revenue and conservation, dubious scientific definitions, lack of community trust in policies, and obscure user rights and land tenures. The indigenous people in southwest China have shown that local livelihood practices can be advantageous to long-term conservation. The authors argue for supporting ongoing sustainable use of natural areas by indigenous people rather than creation of new protected areas.

- Yip JKL and Lai PCC, 2007. A new *Camellia* record for Hong Kong, *Camellia furfuracea*, and its propagation trial. *Hong Kong Biodiversity* 14: 15-16. www.afcd.gov.hk/english/publications/publications_con/files/IssueNo14.pdf (附中文摘要)

- Yip JY, 2006. A note on the use of nest boxes by owls and other birds in the Hong Kong Wetland Park. *Hong Kong Biodiversity* 13: 15-16. www.afcd.gov.hk/english/publications/publications_con/files/hkbonewsletter13.pdf (附中文摘要)

- Youn Y, 2006. *Climate Change, Kyoto Protocol and Forest Sector*. Korean Studies Information Co., Ltd, Paju, Korea.

- Zhang Hua, Zhang Ganlin, Zhao Yuguo, Zhao Wenjun and Qi Zhiping, 2007. Chemical degradation of a Ferralsol (Oxisol) under intensive rubber (*Hevea brasiliensis*) farming in tropical China. *Soil & Tillage Research* 93: 109-116.

海南的一项研究发现，同草地相比，种植橡胶会大大降低土壤有机碳和微生物生物量碳的含量，令土壤酸化（pH 值降低了 0.5），可交换铝含量增加。橡胶加快了土壤化学性质退化的过程。在热带橡胶园内需要采取管理措施来维持土壤质量。

A study in Hainan found that rubber cultivation resulted in a significant decline of soil organic carbon and microbial biomass carbon relative to grass fields. Soil pH decreased by about 0.5 units, with an increase in exchangeable aluminium. Rubber intensified the process of soil chemical degradation. Management practices are needed to maintain soil quality in tropical rubber farms.

- Zhang LB, Liang B, Parsons S, Wei L and Zhang SY, 2007. Morphology, echolocation and foraging behaviour in two sympatric sibling bats, *Tylonycteris pachypus* and *T. robustula* (Chiroptera: Vespertilionidae) *Journal of Zoology* 271 : 344-351.

- Zhou Guoyi, Guan Lili, Wei Xiaohua, Zhang Deqiang, Zhang Qianmei, Yan Junhua, Wen Dazhi, Liu Juxiu, Liu Shuguang, Huang Zhongliang, Kong Guohui, Mo Jiangming and Yu Qingfa, 2007. Litterfall production along successional and altitudinal gradients of subtropical monsoon evergreen broadleaved forests in Guangdong, China. *Plant Ecology* 188: 77-89.

在广东鼎湖山自然保护区，松林的年枯枝落叶生产量是 356 克/平方米，山地（海拔 500 – 800 米）常绿阔叶林为 489 克/平方米，而成熟的低地森林，无论是松树和阔叶树混交林、季风常绿林和沟谷雨林，每年的枯枝落叶生产量高达 849 – 1061 克/平方米。松林的枝杈重量所占比例（9%）也低于其他的森林类型（16 – 25%）。随著松林的自然演替，在 20 年中它的枯枝落叶生产量也在逐渐增加，但是研究结果表明，在砍伐顶级森林后，在 50 年内次生林的枯枝落叶生产量也不能恢复原来的水平。

At Dinghushan stands of mature lowland forest, whether of mixed pine-and-broadleaf, monsoon evergreen broadleaf or ravine rainforest, were found to have high annual litter production (849-1061 g m⁻²) relative to pine forest (356 g m⁻²) and mountain (500-800 m asl) evergreen broadleaf forest (489 g m⁻²). Pine forest also had a lower proportion of branches (9% by weight) than other forest types (16-25%). Pine forest litterfall increased gradually over 20 years, with its successional development, but the results suggest that the litterfall production of felled climax forests cannot be replaced within 50 years of regrowth.



提高學術界對生物多樣性保育的貢獻

Enhancing the impact of academe on biodiversity conservation

約翰·馬敬能

生物多樣性特約顧問

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為了遏制生物多样性的急剧减少，实在迫切需要生物学家、生态学家和分类学家的支持和帮助；然而事实上，他们能发挥的作用却往往令人失望。我希望在这里指出一些造成这种现象的原因，以及在那些工作领域他们可以发挥更大的影响。

曾几何时有一次与云南西双版纳国家级自然保护区局长交谈时，我问他最大的管理问题是什么；我预计他会提出偷猎、社区对自然保护区的蚕食或者是大象造成的危害等的问题。然而，令人惊讶的是，他认为最大的管理问题竟是来自从外面到自然保护区做科研的人员：这些人到来便期望他给予协助，如免费提供食宿、交通和向导等；然后他们会随意采集并带走标本不作任何解释，不指导或培训自然保护区的工作人员；不给自然保护区留下鉴定名单等研究结果，即使有重复采集的标本也不会留一份在自然保护区；而且以后发表文章时也不对自然保护区表示感谢。这些研究人员成了他管理上很大的负担。

很显然他碰到的是一些科研人员很恶劣的行为表现，没有体现出双方合作要互惠互利的原则。我们在这里提出在自然保护区内进行研究或采集标本时科研人员应该遵守的行为：

- 提前办理审批手续
- 负担自己的费用
- 把重复采集并已鉴定的标本留在自然保护区
- 向自然保护区工作人员通报研究结果
- 教导自然保护区工作人员有关自己专业领域的分类鉴定方法
- 根据研究结果向自然保护区管理层提出建议
- 在发表的文章中鸣谢自然保护区
- 文章发表后把刊物送给自然保护区

这样的要求可以写进研究批准文件或合作协议书中，让双方都清楚各自的责任。

如果是自然保护区邀请研究人员来研究急需解决的问题或管理事宜，当然会乐意考虑为研究人员免费提供食宿、向导和后勤服务，甚至还可能付上一定的报酬。但是科学家必须知道，大多数自然保护区经费都很紧张，就算是这样

Biologists, ecologists and taxonomists are urgently needed to support and assist in the battle to preserve our fast diminishing biodiversity, yet their impacts on conservation are often disappointing. I would like to identify some of the reasons why this is so and list a number of areas where their positive impacts could be significantly enhanced.



保護區職工從考察人員身上學到不少東西。
Reserve staff can learn a lot from researchers.

I once asked the director of Xishuangbanna National Nature Reserve in southwest China what he considered was his biggest management problem. I had expected him to answer poaching, encroachment or even elephant damage but was surprised when he replied that his biggest problem was visiting researchers. He found researchers a great burden. He claimed they arrived expecting his assistance, free accommodation, transport and guides. They collected what they wanted without explanation. Took away specimens, never taught the local staff, did not give the reserve lists of identifications or duplicate specimens and did not acknowledge the reserve and its staff in any subsequent

publications.

Clearly he had been exposed to some very poor behaviour on behalf of the researchers and had failed to ensure that cooperation was given in a fair tit-for-tat manner. We can list the sort of arrangements that should be expected of researchers who wish to undertake studies or collections inside protected areas (PAs):

- apply for permission with due notice;
- cover their own costs;
- deposit identified duplicates of any specimens collected;
- report to the staff on their findings;
- teach staff to identify taxa of their specialisation;
- provide management with advice based on their findings;
- acknowledge the PA in publications;
- send copies of subsequent publications to the PA management.

Such requirements can be written into research permits or agreements so that both parties have a clear understanding of their expected roles.

Where a PA needs to enrol researchers to investigate pressing issues or management concerns they will certainly be more willing to provide accommodation, guides, logistical assistance and maybe even fees for such professional assistance. But scientists must recognise most PAs are heavily cash-starved and they should try to secure grants or their own institutional funding even on these occasions. The group of scientists engaged in the Kadoorie Farm-sponsored studies on South China forests show how this can be done.

的项目亦应尝试自筹经费。嘉道理农场暨植物园在华南森林地区进行的生物多样性调查，就展示出较好的处理。

专业人员能够发挥重要作用的领域包括

- 调查、编目和评估；
- 自然保护区的区划；
- 生物多样性和相关环境条件的监测；
- 生存力模型和研究；
- 制定生态修复的方法；
- 研究关键物种或生态系统；
- 自然保护区周边拟建工程项目的环境影响评价；
- 对自然保护区工作人员进行鉴定、调查和监测技术的培训；
- 为自然保护区工作人员提供采集和鉴定工具；
- 对学生进行生物多样性教育，鼓励他们积极参与保育工作；
- 宣扬自然保护区和生物多样性；
- 通过游说和影响提高领导、规划人员和决策者的环保意识；
- 从事具有更重大实际意义的研究课题。

大多数科学家都不擅长与人交流。他们必须采取主动，加强这方面的能力。在解释技术问题，要把自己放在普通人的水平上出发，尽量使用简单通俗的语言和词汇。还要清楚知道，自己津津乐道的专业学问，在大部分的市民、当地群众和政客的眼中可能不过是钻牛角尖，因为他们感兴趣的不是拉丁学名和生物学理论，而是在现实世界中如何解决柴米油盐这些基本的开支、如何达致收支平衡以及增加收入等问题。

从另一方面来说，管理人员、规划人员和决策者也不应一面倒地吧学术界视为毫不相关、难以理解和枯燥乏味而置之不理。我注意到，中国的政府官员很多时候都不愿意去寻求科学家的看法，情愿靠自己的估计来做决定，而不去徵询在相关的领域浸淫了几十年的专家的意见、或邀请其他部门参与工作。但情况在不同的国家与文化都有所差异，如越南政府就很尊重科学家，而省科学和技术委员会在政策和规划咨询中亦担当很重要的角色。所以很多时候如果规划负责人不怕麻烦邀请科学家参与规划当中的讨论，一般来讲他们都很乐意回答问题。

政府官员工作繁重，而且职务越高，时间相对也就越少。一位部长根本没有时间去阅读一篇科学论文，去了解最新研究成果在现实世界中的应用价值。另外，由于科学家很抗拒在发表论文前透露研究结果，而在学术刊物上发表论文又要等候很长的时间来审阅、接受到最后出版，因此进一步延缓了科学成果的使用。

为了解决这些问题，东盟国家在东盟生物多样性中心的项目工作中，成立了一个专门的科学委员会。这个委员会在每个东盟国家里都有委员，负责审视并掌握自己国家正在进行的相关科学研究的最新动态。这个委员会能够让一些重大科学成果尽快引起高级环境保护官员的注意，在这些成果的基础上，推动最新最佳的生物多样性保育和管理措施。中国环境与发展国际合作委员会(CCICED)辖下的各个工作组也发挥同样的作用，为最新科学理念进入最高层次的规划提供了一条大直路。

Areas in which academe can be of great value include:

- survey, inventory and evaluation;
- zoning and planning of PAs;
- monitoring of biodiversity and relevant environmental conditions;
- viability models and studies;
- development of ecological restoration methods;
- studies of key species or ecosystems;
- Environmental Impact Assessments of planned developments around PAs;
- training of PA staff in identification, survey and monitoring techniques;
- providing collections and identification tools to PA staff;
- educating students in biodiversity issues and encouraging students to take an active interest in conservation;
- promotion and propaganda about PAs and biodiversity;
- lobbying and influencing leaders, planners and decision makers into greener thinking;
- engaging in research topics of greater practical relevance.

Most scientists are poor communicators. They must make active efforts to improve their skills in this direction. They should put themselves in the layman's position when explaining technical arguments, try to use simple language and terminology and realise that whilst they themselves may be fascinated by the minutiae of their specialist subject, most of the public, local people and politicians are not impressed by Latin names or biological theories but are interested in the real world of meeting daily needs, covering costs and earning income.

On the other side of the coin, managers planners and decision makers should not so readily dismiss academics as irrelevant, incomprehensible or tiresome. I notice a huge reluctance to approach or seek opinion from scientists among Chinese government officials who would rather make their own uninformed decisions than seek views from those who have been studying the issues for decades, or involve other agencies in their affairs or projects. The situation differs between countries and cultures. In Vietnam scientists are more respected by government and provincial science and technology committees play a much larger role in advising on policy and plans. Scientists often do have the answers if planners would take more trouble to engage them in planning debate.

Government officials are busy people and have less and less time the more senior they become. A minister does not have time to wade through a scientific paper to seek the real-world significance of the latest research findings. In addition the application of scientific findings is delayed by a huge reluctance by scientists to release any information before it is published and a second delay in the long waiting lists for scientific papers to be reviewed, accepted and eventually published by scientific journals.

In an effort to counter these problems, the ASEAN countries have established a special scientific committee under the work programme of the ASEAN Centre for Biodiversity. The committee has members in each ASEAN country with the role of reviewing and keeping abreast of the relevant scientific research taking place in their own countries; it accelerates the process of bringing significant findings to the attention of senior environmental officials and promotes newest best practices for conservation and management of biodiversity based on this research. The working groups established under the Chinese Council for International Cooperation in Environment and Development (CCICED) served a similar function for China and provided a fast track for the latest scientific ideas to feed directly into planning at the highest levels.



規範管理，促進保護區發展—海南自然保護區科學研究探討

Setting norms for better nature reserve management and development—A scientific research perspective from Hainan nature reserves

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海南自1960年开始筹建第一个自然保护区—尖峰岭热带森林自然保护区以来，自然保护区建设事业在各级政府部门的大力支持下，得到了较好发展，至2006年底已建成森林、野生动植物及湿地类型自然保护区29个，总面积为236,910公顷，占海南省陆地面积的6.98%，初步形成了一个以保护森林、野生动植物、湿地等资源的海南自然保护区体系。自然保护区开展科学研究对探索保护与持续利用生物多样性资源的技术和知识，对自然保护区资源实施有效保护，推进自然保护区的可持续发展等具有重要作用。



圖一：保護區職工可認識到海南濕地上的各種動物（2003年水鳥調查）
Fig 1: Getting to know the Hainan wetland fauna (Waterbird Survey in 2003)

Nature reserve establishment in Hainan dates back to 1960, when Jianfengling Nature Reserve was set up. With great support from government at all levels, nature reserves in Hainan are comparatively well-developed. The province had 29 reserves by 2006, each specifically responsible for forest, wildlife or wetland conservation. With a combined area of 2,369 km², the nature reserves cover 6.98% of Hainan's land area. They have long been important in exploring techniques and knowledge of conservation and sustainable use of biodiversity, further enhancing the protection and sustainable development of the reserves.

保護區開展科學研究工作取得的成績

回顾建立自然保护区四十多年来，特别是海南建省以来，自然保护区开展科学研究工作取得的成绩，可概括为以下几方面：

1. 自然保護區科學研究工作初具規模，推動自然保護區的建設和管理

自然保护区与科学研究之间是相互促进的。一方面，自然保护区由于其完整的生态系统、丰富的物种资源和优越的自然环境条件，具有很高的科研价值，为生物、生态、地质、地貌、水文、经济及农林等学科提供了良好的生态监测和科学研究基地。目前，海南自然保护区科学研究工作经过多年努力，已经具备一定规模和基础，

Achievements of scientific research

Research conducted in nature reserves in Hainan have improved in several ways over the past 40-odd years, particularly after Hainan was established as a province.

1. Science strengthens the development and management of nature reserves

Nature reserves and scientific studies have been mutually beneficial. On the one hand, nature reserves are of very high significance in scientific research, providing a key foundation for ecological monitoring and conducting research in biology, ecology, geology, hydrology, economy and agro-forestry due to their relatively intact ecosystems. Recently, scientific studies carried out by Hainan's reserves have grown in scale and quality. Sixteen reserves now have specific divisions to monitor the progress of scientific research, whereas ten other reserves including Bawangling, Datian, Jianfengling, Diaoluoshan and Dongzhaigang have fostered long-term interactions with scientific research organisations. Jianfengling, Bawangling and



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圖二：保護區人員與專家在探討海南長臂猿的生境利用
Fig 2: Reserve staff join scientists in understanding gibbon habitat use

据统计已有16个自然保护区建立了科研管理机构，霸王岭、大田、尖峰岭、吊罗山、东寨港等10个自然保护区也与科研单位建立了长期联系，尖峰岭、霸王岭、东寨港等自然保护区已经成为国内外闻名的科研基地；另一方面，科学研究工作的开展又能推动自然保护区建设和管理水平的提高。多年以来，各级管理部门已经认识到科技对保护区管理工作的促进作用，在充分发挥自身科技力量的同时，还广泛组织各有关部门的科技力量，积极开展自然保护区建设与管理、野生动植物生物学、生态学、繁殖技术、疾病防治等一系列科学研究，较好地推进了海南自然保护区的保护和管理水平的提高。

2. 組織實施專項科學研究、救護與恢復瀕危物種

海南建省以来，通过在自然保护区积极开展各种科学研究工作，其中东寨港自然保护区积极贯彻“保护、恢复和发展”的方针，建立保护区以来，积极开展保护区资源调查、物候观察、生物量测定、人工育苗、造林试验和红树林生态系统能流物流研究等，取得一定成效，较好地保护红树林及湿地资源。

此外，亦特别着重濒危物种的拯救保育工作，先后建立了5个野生动物救护繁育中心和10多处珍稀植物培育基地。我们实施“海南坡鹿及其栖息地拯救工程”以来，海南坡鹿栖息地得到了较好的保护，有效地增加海南坡鹿种群数量，根据统计，海南坡鹿也由保护初期的26头发展到1785头（2007年6月调查资料）。同时，海南坡鹿迁地保护和建立野外种群工作也取得了重大发展，至2007年6月已经建立了10个栖息地和4个野外种群分布点。与香港嘉道理农场暨植物园等部门组织实施“海南



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圖三：海南長臂猿
Fig 3: Hainan Gibbon (*Nomascus hainanus*)

Dongzhaigang are all internationally renowned research bases. Conversely, scientific research can improve the quality of nature reserve development and management. Over the years, management authorities at all levels have come to value these scientific efforts in developing nature reserves, and joined with other departments to initiate a series of scientific studies concerning reserve development and management, wildlife biology, ecology, breeding techniques, and the prevention and cure of animal and plant and plant diseases. These projects in turn have made considerable contributions to reserve management.

2. Specific research projects, rescue and recovery of endangered species

Since Hainan Province was set up, many specific research projects have been taken place in nature reserves. In compliance with the principles of “Conservation, Recovery and Development”,

Dongzhaigang has instigated various kinds of work, such as integrated survey of reserve resources, plant phenology observation, biomass measurement, afforestation trials as well as energy and nutrient flow in mangrove ecosystems. Successes in these areas have accelerated the protection of mangroves and wetlands.

Nature reserves have also been actively involved in conservation of endangered species by establishing five wildlife rescue and breeding centres and ten bases for rare plant propagation. Since the implementation of the rescue project of the Hainan Eld’s Deer (*Cervus eldii hainanus*), their habitats have been better protected while the number of individuals has been drastically increased, from 26 to 1,785 (as of June 2007). Meanwhile, *ex-situ* conservation and expansion of wild populations have been highly successful. Ten sites with suitable habitats have been identified,

with four populations being released and established up to June 2007. The “Hainan Gibbon Conservation Action Plan” co-organised with Kadoorie Farm and Botanic Garden (KFBG) has been in implementation for several years, directing actions such as population monitoring, habitat rehabilitation and studies of food choice. The number of Hainan Gibbons *Nomascus hainanus* has increased from seven known individuals in 1980 to about 19 in early 2007.

3. Studies help build reserves’ capacity

Since 1997, under the planning of the Forestry Department, there have been a number of surveys of wildlife and wetlands, strengthening the basis for protection. Some reserve staff have been relocated and specifically appointed to



长臂猿保护行动计划”以来，在海南长臂猿种群数量监测、栖息地恢复、采食植物调查等方面开展了一系列科研工作，取得了良好成效，海南长臂猿已经从1980年仅有的7个个体发展到2群19只（2007年初资料）。

3. 廣泛開展保護區資源調查等科研工作，著重人才培養

自1997年以来，在林业部的统一部署下，海南进行了多次包括自然保护区在内的野生动植物和湿地资源调查，为加强野生动植物和湿地保护管理奠定基础。同时，通过抽调和选派自然保护区工作人员参加各种资源调查和相关科研工作，不仅提高了参与人员的水平和工作素质，而且培养了一批真正为自然保护区服务的基层骨干力量。多年来，经过广大科研工作者和自然保护区员工的辛勤努力，不断加强自然保护区科学研究，为野生自然资源的有效管理工作提供了科学依据。

4. 積極參與科學研究等國際項目工作，擴大保護區的影響力

随着中国的改革开放，海南的自然保护事业也倍受重视，1992年包括东寨港和清澜港保护区在内的湿地范围被列为国际重要湿地，尖峰岭保护区也于1999年加入了“人与生物圈保护网”。国际木材组织 (ITTO)、德国技术合作公司 (GTZ)、世界银行自然保护基金 (GEF)、香港嘉道理农场暨植物园 (KFBG) 等相继在尖峰岭、五指山、霸王岭、鹦哥岭等自然保护区开展了国际合作项目，并在自然保护、科学研究、社区发展、环境教育等方面开展了一系列的活动，取得了显著效果。保护区不仅学到了先进技术和管理经验，培养了一批专业技术人才；而且，通过开展对外合作与交流，提高了保护区知名度和影响力，促进了海南自然保育事业的发展。

保護區開展科學研究存在的問題

虽然海南在保护区科学研究工作方面取得了一些成绩，也积累了一定的经验，但还存在著许多问题。

對保護區科學研究重要性認識不足

随着人口的持续增长和经济的快速发展，人口与资源、经济建设与生态保护的矛盾日益突出，一些保护区的领导，没有充分认识到保护区开展科学研究对自然保护区的建设和发展有著极其重要的作用。没有意识到科学研究是自然保护区工作的灵魂，即是基础性工作，又是开拓性工作，是实现自然资源有效保护与合理开发利用的关键。由于管理者的认识不到位，缺乏人力和物力的投入，保护区许多重要的科研工作未能开展或未能得到全面的开展，不仅影响了科研工作的效果，而且，影响了科研工作者及合作方的积极性，许多科研成果没有得到实施和推广。

保護區科學研究的總體發展水平較低，良莠不齊

虽然海南自然保护区的科学研究工作已初见成效，但总体发展水平仍然较低，没有形成规范化、制度化的管理体系。保护区科学研究机构不健全，对科学研究工作的资金投入也严重不足，造成人才匮乏。此外，保护区科学研究工作发展极不平衡，各保护区的基础条件、受关注程度、人员培训机会和科研开展数量的差异往往非常大。这些科研工作发展不平衡的问题，相当程度上影响

take part in scientific research, strengthening their work quality and forming a strong backbone of staff to serve the nature reserves. In recent years the hard work of scientific researchers and reserve staff has led to improved understanding and data essential for the effective management of wildlife.

4. Involvement in international scientific projects raises the stature of nature reserves

Alongside the reforms and gradual development in China, nature conservation in Hainan has gained considerable recognition. In 1992, Dongzhaigang and Qinglangang Nature Reserves were listed as internationally important wetlands, and Jianfengling Nature Reserve was included in the network of “Man and Biosphere” in 1999. The International Timber Trade Organization (ITTO), the German organization GTZ, Global Environment Facility (GEF) and KFBG have launched a series of activities focusing on nature conservation, scientific research, community development and environmental education, with fruitful results. Nature reserves have equipped themselves with advanced techniques, management skills and professional staff, and even increased their profile and influence through external co-operation and exchange, further speeding up the development of nature conservation in Hainan.

Problems faced by nature reserves in launching scientific research

While they have made achievements and acquired experience, there remain numerous problems.

• Incomplete appreciation of the importance of research

Continued population growth and rapid economic development have deepened the conflicts between people and resources, economic development and ecological protection. Some officials are still not fully aware of the importance of scientific research in reserve creation and development. They have no idea that research is the essence of nature reserve management, or that research – pure and applied – is the key to the protection and rational use of natural resources. As managers have made little investment in either human or capital resources due to their poor scientific understanding, many important studies could not be launched or developed in a coordinated way, which further discourages scientific researchers and other parties, impairing research development.

• Inconsistent pace of development among reserves

A lack of management norms and systems, capital input and sound scientific institutional structure as well as manpower shortage have constrained the growth of scientific research. One outstanding problem is the different development pace of different reserves, which receive varying degrees of attention, capital input, development and training opportunities. Consequently in certain reserves both work quality and staff ability have much room for improvement.

• Unsystematic management of research among the reserves

Scientific research management is a core component of nature reserve management. But shallow scientific understanding, lack of experience and poor methodology inevitably lead to weak and chaotic management. Main problems include:

- The lack of a research management division, or else of staff competent to meet the required standard of work;

了保护区的管理工作。

保護區對科學研究工作管理極不規範

保护区对科学研究工作管理是保护区管理工作的重要组成部分。但是由于认识不到位，缺乏经验和方法，海南保护区对科学研究工作管理混乱和极不规范。主要体现在：

- ▶ 大部分保护区没有设立专门的科研管理部门及管理人员水平达不到要求；
- ▶ 没有制定保护区科学研究规划，重覆许多科研工作，造成资源的严重浪费，影响了资金的再投入；
- ▶ 缺乏对保护区科学研究的监督检查制度，未能确保科研项目顺利实施，影响了科研工作的成效；
- ▶ 对保护区科学研究成果的档案管理重视不够，缺乏法律意识，存在科学研究成果被挪用、占用及丢失现象，对科研工作者或合作方有消极影响。

所有这些，都必须引起保护区管理者的高度重视，要认真加以研究和解决。

保護區未來科學研究工作計劃

目前，各级政府部门高度重视生态环境建设，给海南自然保护事业，特别是保护区科研工作带来了前所未有的发展机遇，保护区管理部门必须要采取有效措施，推动野生动植物保护及自然保护区科研工作的可持续发展。

(1) 切實加強領導，規範保護區科學研究工作的管理

要通过不断的培训和宣传，提高海南各级保护区管理人员的科研管理意识，让其认识到自然保护区不仅是科学研究的天然试验室，而且，科学研究是保护区实施有效保护，实现保护区管理目标的保证。同时要加强对领导，建立及完善管理机构，落实管理人员切实履行职责。主要领导要亲自了解，帮助解决科学研究工作的实际问题。特别要规范对保护区科学工作的管理，切实做好如下工作：

- 制定保护区科研规划和计划—研究规划和计划是保护区科学研究工作的基础。完美的科研规划和计划能帮助管理人员确定反映保护区重大保护生态学与保护管理问题的研究项目，并吸引社会更加关心和支援保护区研究事业。保护区科研管理机构，应该根据各保护区的特点和存在的问题，制定相应的科学研究规划，并通过论证和审批后，将其纳入保护区的发展规划。按照批准后的保护区科研规划，保护区科研管理机构应在规划期内制定科研工作的年度计划，并上报审核批准。在年度科研计划中，要明确：一·凡林业局和保护区开设的科研项目，应要有专人负责；二·国内科研单位赴保护区独立进行的科研工作，必须进行审批和登记及有保护区人员配合，并需纳入保护区科研年度工作计划，向保护区管理部门提交活动报告。工作结束后，保护区科

- ▶ Overlapping research in different reserves because of unclear planning, leading to serious wastage of capital;
- ▶ The lack of a supervision and inspection system, such that projects are slow and ineffective; and
- ▶ A flawed recording system: a poorly managed filing system, with most staff unaware of legal ethics, resulting in plagiarism or loss of scientific data.

These problems must receive the attention of reserve managers as soon as possible, so that they can seek new ways forward.

Future plans

Government departments are now paying much attention to environmental conservation, which creates the best-ever opportunity for the development of nature conservation and, especially, scientific research in Hainan. Conservation management sectors should take necessary action to sustain the further development of wildlife conservation and scientific research in nature reserves.

(1) Strengthening leadership for better management

Sustained efforts on training and publicity campaigns are needed to make reserve staff aware not only that nature reserves are a natural classroom for scientific research, but also that this can help realise management goals. Leadership skills of the management level should be strengthened, and management structure established and refined, so that managers can work out the specific roles and responsibilities of reserve staff. Leaders should take more initiative to solve the problems related to scientific research by:

- Formulating plans for scientific research in nature reserves. These should guide research. A research management division should formulate plans with reference to the distinctiveness and existing problems of each reserve. These can be integrated into the nature reserve development plans after rounds of review and evaluation. The department should devise an annual work plan and submit it for endorsement during the planning period. The plan should clearly state the following: (a) a person in charge should be designated for all research projects initiated by the Forestry Department or the reserve itself. (b) all projects operated by research institutes in China must be registered, examined and



圖四：筆者協助編制五指山保護區規劃
Fig 4: The authors working on a more detailed plan for Wuzhishan Nature Reserve

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相片由作者提供 | Photo by Author

圖五：專家們正在鸚哥嶺野外資源調查
Fig 5: Experts engaged in Yinggeling field survey

研管理机构应收集其科学研究报告副本，并作为保护区的科学研究资料库；三·国外专家进入保护区进行科学研究项目合作，由保护区管理部门上报省级保护区主管部门批准，纳入保护区科研规划或年度工作计划，其科研项目成果应由双方共用。

- 建立和完善保护区科学研究工作的管理制度—要明确保护区科研管理机构的职责，培养和具备一定的特殊管理技能，认真制定结合保护区实际的科研管理制度，确保科研工作的顺利开展。
- 重视对保护区科学研究成果的档案管理—科研工作结束后，要进行全面总结，上级下达和保护区开设的科研项目应撰写报告或论文，并连同项目任务书、开题报告、年度实施计划、重要科研资料和调查原始记录、图片、照片等进行归档管理。尽量避免科学研究成果被挪用、占用及丢失现象。

(2) 多方籌集資金，加大對科學工作的投入

资金投入严重不足，是海南自然保护事业发展的重要制约，也是影响保护区科研工作顺利开展的关键因素。自然保护是一项社会公益性事业，是政府的一项职能，保护区科研工作要建立以中央和地方政府投资为主、多渠道筹集资金为辅的投入机制。各级保护区主管部门要积极争取将科研经费纳入每年财政预算，同时积极拓宽筹资渠道，鼓励社会各界捐资和投资。广泛开展国际合作与交流。2007年海南野生动植物自然保护中心与香港嘉道理农场暨植物园携手合作，设立嘉道理海南自然保护

coordinated by reserve staff. The project plans should be integrated into the reserve's annual work plan, and properly reported afterwards. Scientific papers and reports should be kept as departmental records, enriching the management database. (c) Collaborative scientific research projects led by foreign experts will require approval from the provincial department in charge of nature reserves, and also be incorporated into the research plans and annual work plans of the nature reserve. Outcomes will be shared among all collaborating parties.

- Setting up and improving the management system for scientific research. The scientific research department should have clear-cut job descriptions and staff trained with specific skills. A practical management system should be tailor-made to ensure the smooth operation of the various research projects.
- Managing scientific data in an effective information system. When the scientific research projects have been finished, they should be concluded in a comprehensive way, along with project proposals, interim report and annual work plans, while important scientific data and original records, pictures and photographs should be recorded in a reliable filing system. This could protect valuable data from the risks of plagiarism or accidental loss.

(2) Raising funds from various channels to support research

Lack of capital has been a major constraint for Hainan in developing nature conservation and starting scientific research smoothly. Nature conservation is for the betterment and social welfare of society as a whole; therefore reserves should not only rely on funding from central and local Government, but also

小额资助项目，并希望通过项目运行，提高自然保护区有关人员的业务素质，激发他们工作的积极性和主动性，从而促进海南自然保护事业的建设和发展。

(3) 其他加大自然保护区科研力度的措施

- 认真做好海南各自然保护区，特别是一些建立比较早，基础比较薄弱的省级自然保护区的资源调查、科学考察工作，查清本底情况；
- 以自然保护区为平台，以保护物种为重点，采取内引外联的方式，吸引、支援大专院校、科研单位、国际组织和机构等到保护区开展科学研究；
- 加强保护区科研能力建设，提高自然保护区人员的水平；
- 积极开展自然保护区生态价值、经济价值评估的研究。

按照不同类型自然保护区，选择有条件的进行试点，不断总结和建立评估指标、标准和办法，并全面组织实施。目前，鹦哥岭省级自然保护区正在与香港嘉道理农场暨植物园紧密合作，共同建立鹦哥岭示范保护区，并期望以点带面，促进海南自然保护区的建设与发展。

explore possible external funding channels. Thus reserves should strive to incorporate scientific research as an annual budget item. More open-minded collaboration with other sectors, investment channels and international institutions are possibilities. This year, HWCC has joined forces with KFBG to set up a small-grants project scheme for reserve staff in 2007, through which the quality of work can be increased, and the reserve staff are stimulated to be more proactive. Such efforts will be helpful in promoting effective nature conservation.

(3) Other measures to strengthen research

Further strengthening can be achieved in several ways:

- Launching inventories and research in every Hainan reserve, particularly those with longer establishment but laxer foundations, to obtain baseline data;
- Attracting and supporting colleges or universities, scientific institutions and international conservation organisations wishing to conduct research in nature reserves;
- Building staff capacity; and
- Taking more initiative to instigate research on the ecological and economic value of the nature reserves.

Possible research targets are to be selected among different types of reserves for running pilot studies, and assessment indicators, standards and methods should be constantly reviewed and put into practice. Currently, Yinggeling Nature Reserve is working closely with KFBG on an Experimental Nature Reserve project, intended to provide a model for other reserves.



圖六：海南坡鹿
Fig 6: Hainan Eld's Deer (*Cervus eldi hainanus*)



發揮科學的作用：世界雉類協會的觀點

Making science count: a World Pheasant Association perspective

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世界各地的科学期刊都充斥着大量的保育文章，从它们的题目来看，都是能指导如何达成成功的保育措施，这些文章的作者大概也相信自己的文章确实有这样的作用。但实际上这些文章以及它们描述的研究究竟有什么样的实际作用呢？

在理想的世界里，与生物多样性有关的政策和管理应该是建立在良好的科学基础之上，这包括通过针对性的研究来获得所需的资料，以及制定一个有力的项目来真正实现既定的目标。这听起来十分简单，但是为什么真正成功的例子却寥寥若晨星？

我们不是生活在理想的世界里，但是，我们还是可以提高我们工作的效果的。世界雉类协会为此已制订出一些方法，来提高野外研究应用在保护的价值，及改进其质量。这些方法已经取得了初步的成功。

提高研究的實用价值

像世界其它地区一样，中国正在进行大量有助于了解生物多样性研究，其中包括鉴定新的物种及收集其分布信息的基础性的研究，以及更覆杂深入的研究项目，像试图理解一些物种类群的进化关系和说明它们的生物地理特徵。在这两类之间，研究人员亦试图掌握一些生态学基础数据，如栖息地利用和繁殖生物学。但是我们要问，在这些研究成果中，有多少最后能到达负责这些物种保护和管理的相關人士手里，如国家林业局和省林业厅领导，广西、广东或其它省市的自然保护区管理人员？答案是：屈指可数。

在成立后的30多年的时间里，世界雉类协会一直在致力于提高野外研究的水准，它进行的很多研究项目都获得

Scientific journals across the globe are full of papers with titles that sound vital to achieving conservation success. The authors probably believe this to be the case, but is it true? What impact do these papers, and the research they describe, really have?

In an ideal world policies and management that affect biodiversity would be based on good science. This would involve both targeting research so that it produces needed information, and then developing a strong project that actually achieves what it sets out to. It sounds so simple, but why are there so few examples of this actually working?

We don't live in an ideal world, but it is possible to make our efforts much more effective than they are now. The World Pheasant Association (WPA) has developed approaches to both improving the conservation relevance of field research and increasing its quality. These are showing signs of success.

Improving the relevance of research

The amount of research that helps us understand biodiversity is increasing in China, as it is in many other parts of the world. There are baseline studies that are identifying new species and producing new information on their distribution. There are also more sophisticated projects designed to understand the evolutionary relationships of some species groups, and to explain the patterns of their biogeography. In between, researchers are trying to understand many aspects of basic ecology, such as habitat use and breeding biology. But how many of these studies have produced results that find their way onto the desks of policy-makers in the State Forestry Administration in Beijing, or provincial forestry departments, or to reserve managers in Guangxi, Guangdong or elsewhere across China – the people responsible for conservation management of the species concerned? The answer is too few.

WPA has been promoting the quality of fieldwork over much of its 30 years and many of the projects that have been carried out have produced just the sort of baseline information on status and distribution mentioned above. The result of this work throughout the 1980s and 1990s was that our Chinese colleagues in the China Ornithological Society (based in the College of Life Sciences at Beijing Normal University) discovered a lot about some Chinese pheasants, such as Cabot's Tragopan *Tragopan caboti* and Elliot's Pheasant *Symaticus ellioti*. This left us in the position a few years ago where there was a need to think carefully about what sort of work should be undertaken and promoted: there were so many needs and opportunities but (as usual in conservation) far too few people to carry out this work, and only a tiny proportion of the funds necessary were ever likely to be available. The result of this review process, which involved the Pheasant Specialist Group and the Partridge, Quail and Francolin Specialist Group that we manage with the World Conservation Union (IUCN), is the scheme



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圖一：這隻白鸚是用紅外線照相機拍下的——也道出了善用野外考察數據的必要性。

Fig 1: Wild animals, like this Silver Pheasant, can be hard to encounter – a good reason to make the best use of field data.

了上述提到的物种数量和分布的本底资料。由于80年代和90年代这些工作的结果，我们在中国的伙伴，亦即设在北京师范大学生命科学学院的中國鸟类学会，发现了很多关于中国雉类的知识，如黄腹角雉和白颈长尾雉。几年前，我们到达了一个十字路口，需要认真考虑下一步的工作方向和重点应该是什么：需要进行的研究和机遇很多，但毕竟人力有限（在保育界都是这样），而且经费来源亦非常有限。在我们和世界自然保护联盟联合管理的雉类专家组和鹑类专家组的分析回顾下，产生了如下方案（见图二）。



圖二：保護行動的程序，從分類資料開始到達成保護效益（參考 Fuller 等¹）

图二所示的第一阶段反映没有任何资料来指导保护行动的情况。当我们到了第六阶段，我们已经可以做到与自然保护区的管理人员一同合作来改善有关物种的保护状况了。现在世界雉类协会正在使用这个程序来指导大部分工作。总的来说，我们的目标是尽快跨过第一和第二阶段，来面对后面更大的挑战，即确定雉类受什么威胁和应该采取什么样的应对措施。

这种方法效果显著，而现在有很多中国的雉类研究人员正在逐步按照这个程序，进入更高的阶段，开始影响管理和政策。一个典型的例子是1990至1995年间在四川南部进行一系列有关四川鹧鸪（当时被世界自然保护联盟红色名录列为极危的物种）分布范围的调查。这促使世界雉类协会与四川林业厅联合对它的生态学和政危原因进行了更详细的研究，发现森林经营方式是影响其种群数量和繁殖成功的主因。所以，当日后出现可以影响林场经营方式的机会时，已经积累了充足的相关知识。结果是，在其面积不大的分布区域内建立了几个自然保护区，而且它们的发展亦得到了北英格兰动物学会（North of England Zoological Society）的支持。目前世界雉类协会和四川省林业厅正在联合进行一个项目（资金来自关键生态系统合作伙伴基金），为生活在当地森林里的四川山鹧鸪和其它雉类制定切实可行的监测规程，即程序中的最后阶段—监测。

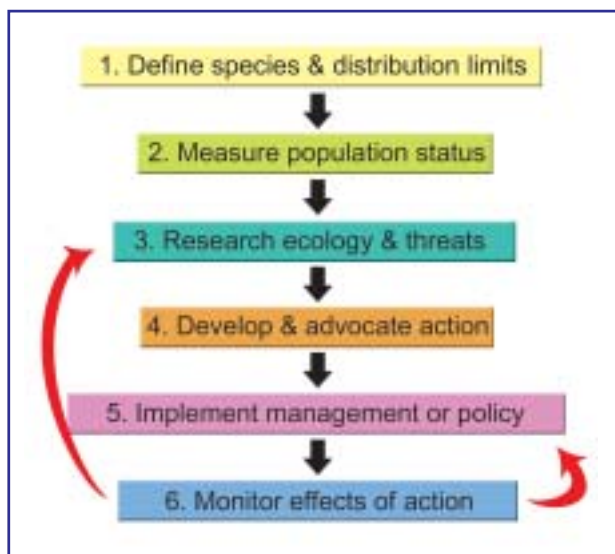


Fig 2: Steps in conservation, from taxonomic ignorance to measurable conservation benefit (based on Fuller *et al.*¹)

presented in Fig 2.

Stage 1 in Fig 2 reflects a situation where we know nothing that can help guide conservation. By the time we move to stage 5 and 6, we are in the position where we are working with managers of reserves (for example) to improve the conservation status of species. Now WPA uses this scheme to guide much of its work. Overall our aim now is to move as quickly as possible through stages 1 and 2 to the more challenging job of determining what is causing problems for pheasant species and what can put this right.

This scheme is working and there are now many examples where Chinese pheasant researchers have moved from one stage to the next and so are beginning to influence management and policy. A striking example is in southern Sichuan, where surveys carried out between 1990 and 1995 plotted the distribution of the Sichuan Partridge *Arborophila rufipectus* (then listed as Critically Endangered on the IUCN Red List). This led on to more detailed research with the Sichuan Forestry Department into its ecology and the pressures it faced, which showed that forestry operations affected population size and breeding success. So, when the chance arose to influence the way existing forest farms were managed, there was plenty of knowledge available. As a result several protected areas have been created in its small geographic range, and their development is being supported by the North of England Zoological Society. The final stage in our scheme – monitoring – is now being developed through a collaborative project between WPA and Sichuan University (funded by the Critical Ecosystem Partnership Fund) to develop practical monitoring protocols for the partridge and other pheasant species in these forests.

Increasing the value of field research

Gathering information from the field in China is not easy. Many study areas are remote, are on steep terrain and have thick vegetation with few trails, all of which it make difficult to gather information. Therefore, there is a need to take every opportunity to make the fieldwork useful and valuable so that any time spent on the slopes of Hainan's mountains, or the forests of Guangdong, contribute as much high-quality information as possible. As Chinese fieldworkers interact more and more with their international colleagues, there are more and more opportunities



提高野外研究的价值

在中国收集野外数据不是一件容易的事情。很多研究地点位置处偏僻，地形崎岖不平，植被茂密而路径稀少，使得资料收集十分困难。因此，不论是在海南山区的山坡，还是广东的森林里进行研究，都要把握每个机会来提高野外工作的效益和价值，尽可能获得高质量的数据和信息。随着中国野外研究人员与国际同行的交流越益频繁，他们接触学习国外方法和技术的机会也越来越多，从而根据当地的具体情况来进行必要的调整。

随着进一步的交流亦引起一个有趣的变化，那就是学术论文的展示形式。尽管有些人会说这不应该是自然保护工作者的最重要目标，但是毫无疑问，这是广泛传递项目成果的关键环节。一篇学术论文能够在国际著名刊物上发表，是显示研究的设计及进行理想，结果分析充分，讨论有意义。因此，根据这项研究结果设计出来的保护项目，是建立在高质素信息资料之上。但世界雉类协会

to learn about approaches and techniques being developed outside China, so that they can adapt them to local conditions within the country.

One area where this increased communication has shown an intriguing difference is in the presentation of scientific papers. Whilst some might say that this should not be the most important aim of conservationists, it is undoubtedly crucial to communicate the results of projects widely. Publication in a well-respected international journal is usually acknowledged as indicating that the study has been well designed and carried out and that the results have been fully analysed and interpreted meaningfully. So, it is an indicator that any conservation action based on that study is using good-quality information. WPA does not see a need to have every study written up completely in international journals – we simply do not have the time to do that when there is so much more direct conservation work to carry out. However, we do consider that it is critical to have a selection of projects written up. This is because conservationists increasingly need to show that their work is good science. Donors sometimes require this,

方块1. 向国际刊物投稿需要注意的要点

前言部分必须说明这项研究的必要性和价值。如果你声称它对保护有帮助，就必须清楚地说明(譬如说，一个保护区的面积因纳入了林场而扩大了，这就需要研究一个关键物种的栖息地利用，来改进自然保护区的管理。仅仅提出保育“是重要的工作”是不够的！

提出明确的研究宗旨和目标—就目标方面，可点列出来，让人一目了然。

在研究地区的描述要有足够的细节，让人知道研究地点所在，与研究内容有关的资料都要加以详尽的介绍(如该地区的管理历史)。

在研究方法部分，一定要说明针对每项目标的研究方法。对研究方法的描述要足够详细，让其他人能够重覆你的研究(例如，不能简单地说是采用样线法，而是要说明设了多少样线，设在什么地方，样线有多长，巡查样线的时间等)。一些方法对研究人员的技术要求比较高，在这种情况下，要对需要的技术和经验水平作出一个客观的评估。

研究结果部分须对每种方法得来的结果针对每一个目标加以分析。在这部分不要介绍与研究目标无关的结果，以及用其它研究方法获得的结果。很多自称与保护有关的稿件常常在这部分包含着一些人类利用该地区或栖息地的内容，但没有事先说明这是研究目标之一，或说明他们怎样评估这些利用，这种“结果”通常是毫无价值的。

在讨论部分，结果要与宗旨和目标联系起来，亦即说明进行这项研究的整体意义。具体的建议也应在这部分提出。

Box 1. Some key points that papers submitted to international journals should emphasise

The introduction must explain why the study is necessary or interesting. If you are claiming that it has a conservation relevance, this must be made very clear here (e.g. a protected area has been expanded to include a former forest farm and so there is a need to understand the habitat use of a key species so that the management of the area can be improved). It is not sufficient to say that conservation is a “hot topic”!

Your overall aim and specific objectives must be clearly defined – the latter might take the form of a list so that they are very obvious.

The study area should be described in enough detail so that the exact area where the study was carried out could be found and all aspects of the area that are relevant to the study described (e.g. its management history).

Make sure that you describe a method that will show how you have studied each of the listed objectives. The methods must be explained in enough detail to allow someone to repeat your study (e.g. do not just say that you have used line transects, but say how many, how long, where they were sited, what time of day etc). Some methods rely on the observers having a lot of skill or experience with the technique, and in these cases, it is important to give a realistic assessment of this skill or experience level.

The results must show how the results of each method were analysed to address each of the objectives. Do not introduce results here for objectives that you have not already given, or which require methods that have not been described. Many submitted manuscripts that claim to deal with conservation introduce some comments about human use of an area or habitat here, without saying that it is an objective of the study or saying how they assessed such use. In such cases, the “results” are usually worthless.

In the discussion, the results should be related to the aim and objectives and the introduction, which gave the whole reason for the study. Specific recommendations should be made here.

并不认为每项研究都必须国际刊物上发表，因为我们的时间有限，还有很多更迫切的实际保护工作要做。然而，我们也认同选择部分项目来发表是非常重要的，因为保护工作者日益需要证明他们的工作是严谨的科学。捐助机构有时会提出这样的要求，领导阶层亦如是，而且在国外，很多时会根据这些科学报告来决定能否在具有重要保护价值的地点上进行基础建设。

参与重大研究的科研人员，很多时候亦会受到院校的鼓励在国际刊物上发表文章。这使得更多人注意中外刊物对稿件要求上的差别。在过去十年里，世界雉类协会努力向很多同业解释这种差别，并作出怎样撰写研究报告的指引（见方块1），来提高在国际刊物上发表的机会。当中一些是很明显的，值得提出的是，国际刊物特别重视对细节的要求，以及文章内容在承前启后的逻辑性。在申请国际资金来支持你的工作时亦必须注意这两点。

令人欣慰的是，很多中国科研人员进行的研究不仅水平很高，而且是高度针对保护的。可是中国具有如此众多令人神往的物种和栖息地，但我们对它们的了解却又是如此欠缺，它们很多更面对着种种威胁，为此，我们需要更多这样的研究。相对来说，雉类的研究已比较全面扎实，但与我们所需要知道的相比，目前的资料仍然有很大的欠缺。雉类尚且如此，那么其它物种的情况就更迫切，更需要高质素的研究，关键是，要先决定哪些物种最需要研究，然后去将它设计至最高标准。

managers require this and, increasingly outside China, science can be used to determine whether or not infrastructure developments in important conservation areas go ahead.

At the same time, many of those who are carrying out some of the most important research are being encouraged to publish in international journals by their universities. This has led to an interest in understanding the difference in approach between international and Chinese journals. Over the last ten years WPA has worked with many colleagues to help explain this difference and provide some guidance as to how studies should be written up so that the chances of being published in an international journal can be increased (see Box 1). Whilst some of the points seem very obvious, it is the level of detail and the need to show how one section has developed logically from the previous one that is often very different in international journals. This detail and logical consistency are also important when applying for international funds to support your work.

It is excellent that more Chinese colleagues are producing work that is both highly targeted towards conservation action and of a high standard. However, we need to increase the number of such studies because the country is so full of amazing species and habitats that we know so little about, and many of these are under threat. Pheasants are relatively well-studied but we still feel we know so little about them compared with what we need to know. If that is true, then the situation for so many other groups is really urgent. The key is to really consider beforehand exactly what is the most needed study and then plan it to the highest standard.

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科學理論与實踐：中國在植物保育的机遇

Bridging the gap between science and practice: challenges for China in plant conservation

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中国的植物保育研究源远流长。集植物专家大成的《中国植物志》，为世界各地的同类工作立下了标准，而这套丛书亦被美国密苏里植物园翻译成英文。从西双版纳的潮湿森林、干旱的塔哈拉玛干沙漠以至长白山山脉，足证中国植物生态系统多样性之丰富，使全球对这个植物宝库为之着迷。中国的植物不仅在世界各地的花园出现，而由中国的先祖引种驯化的植物现今亦成了多国的粮食。

中国科学成果优秀，却因保育风气未盛，而未能发挥应有的作用。在中国漫长的历史里，也许大部分时间都不需要现今世代所推崇的保护区。神木、受庙宇保护的植被、未被人利用的偏远地区以及相对落伍的交通系统等因素，都能误打误撞地令植物得到保护。

但到了现在，人口及经济迅速增长，中国植物面临开发的压力也在急遽飙升，对希望保育这丰富的植物遗产的人士，带来了严峻的挑战。

以下是一些改善措施的建议：

1. 应大大提升中国受危植物红色名录的素质。这需要慎重覆查中国的植物志，评估各个物种的状况，并厘定其种群趋势。中国的专家辈出，出色的植物园多不胜数，加上有志研究这个植物宝库的学生亦为数不少，这应该是一项相对简单的工作。不过，修订红色名录只是持续监察过程的第一步，让有需要的时候能尽快采取相应的行动。
2. 以众多植物园作为一个渠道，教育市民大众有关保育中国植物的重要性。可以包括一个仿真天然生境的展览，或展示人类如何运用不同的植物以及带出动物与植物同步演化的例子，如大熊猫和竹。
3. 对具经济价值的植物予以特别的重视，如药用植物、木材、观赏植物、农作物及能带来其它经济效益的植物。决策者对这些物种尤感兴趣，保育这些植物同时亦可能令它们不出名的远亲得到保育。而有些野生植物具相当高的观赏价值，用作引种驯化及销售得来的部份收益，可用作保育在野外的种群。中国透过生物多样性宣言承诺跟随可持续利用的原则，应能引领着这方面的发展。

China has a long and distinguished history of research in plant conservation. Its multi-volume set of masterful reviews of the flora of China has set a standard for the rest of the world, and these are being translated into English by the Missouri Botanical Garden. The tremendous diversity of ecosystems from the wet forests of Xishuangbanna to the arid Taklimakan desert to the mountains of Changbaishan, makes China a botanical treasure house of great fascination to the entire world. Chinese plants grace many gardens on all continents and plants domesticated from Chinese ancestors now feed much of the world.

The outstanding state of Chinese science cannot be matched by the relatively immature state of conservation practice in the country. For much of its history, China arguably did not need the kinds of protected areas that characterise the modern world. Sacred groves, vegetation protected by temples, areas remote from sources of exploitation, rustic transportation systems, and so forth, all served to protect vegetation in an almost incidental manner.

But now, with rapid growth in population and economic welfare, the pressure to exploit Chinese plants is growing at a very rapid pace, providing a serious challenge to those seeking to conserve the rich floral heritage of China.

Here are a few suggestions on what might be done to improve this situation:

1. Significantly improve China's Red List of Threatened Plants. This will require a careful review of the entire flora of China to assess the relative status of all species and determine population trends. Given the vast number of experts, the numerous outstanding botanical gardens, and the many students interested in the plant wealth of the country, this should be a relatively straightforward task. But the Red List should be seen as just the first step in a continuous monitoring process that will enable appropriate actions to be taken in a timely manner, when required.
2. Use the many botanical gardens as a means of helping to educate the general public about the importance of conserving the plants of China. This can include displays that reproduce natural habitats, indicate how people use the plants, and illustrate the animal species that have co-evolved with the plants (for example, giant pandas and bamboo).
3. Give particular attention to those plants that have economic value, as medicinal plants, timber, ornamentals, crops, and other economically important uses. Such species are likely to be especially interesting to decision-makers, and conserving them may help conserve their more obscure relatives. Some of the attractive wild ornamental species may be considered for domestication and improved marketing, using a share of the

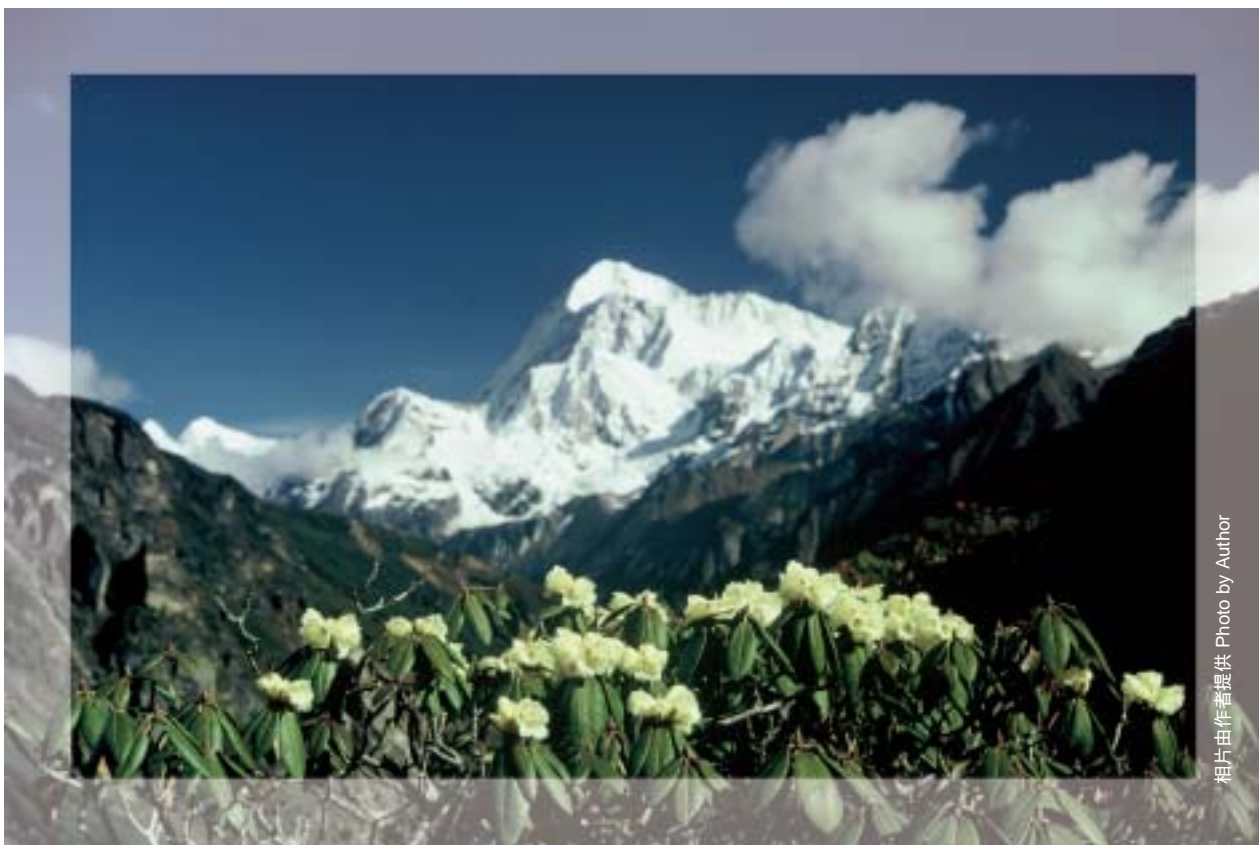
4. 推出简单易用的中国植物野外图鉴。在可见的未来，这图鉴甚至可以是电子版的，非常小巧、可随手握着，还有一个屏幕可以看到植物的辨认特征，这样登山者便能辨认出在保护区沿途碰见的每种花卉，相信这电子图鉴必定能大大提升公众对中国植物多样性的兴趣及支持。此外，有这样简易直接辨认植物的方法，还可以加强对物种的状况及分布的监测。
5. 成立专门的植物保护区，迎合对植物有特别偏好的外国游客。此举可向决策者及保护区管理人展示植物的价值，而一些对植物有特殊价值的地区，更可与国内外的植物园组成工作伙伴。
6. 借2008年奥运会这个机遇，显示中国丰富的植物资源，让外国游客见识到郊野蕴藏的天然宝库。这需要科学家、艺术家、园艺师及保护区管理者之间的通力合作。

中国的植物科学在国际水平上经已达到非常成熟的阶段。可是，市民大众对中国的植物宝库仍未予以重视，而决策者也未意识到各种开发活动会破坏国内的自然遗产以及对野生物种带来威胁。所以保育学家必须与科学家紧密合作，使中国植物多样性得以持续，令保育成为国民引以为傲的事情。

profits to conserve the wild parents of the ornamental plants. The principles of sustainable use, now accepted by China through the Convention on Biological Diversity, should guide any such developments.

4. Develop an easy-to-use field guide to the plants of China. Within the foreseeable future, such a field guide could even be in an electronic form, small enough to be held in one hand but with a screen that could illustrate the diagnostic features. Such an instrument could greatly increase the interest of the general public in China's plant diversity. Being able to identify every flower a hiker might encounter in visiting a protected area will greatly increase public interest and support. Making it easier to identify plants in a relatively simple and straightforward manner could also enhance the monitoring of the status and distribution of the species encountered.
5. Develop protected areas of particular interest to botanically-inclined foreign tourists. This will help demonstrate the value of plants to both decision-makers and those managing the protected areas. Sites of particular importance to plants may form working partnerships with botanical gardens, both in China and abroad.
6. Use the 2008 Olympic Games as an opportunity to showcase the botanical riches of China, so that visitors are aware of the natural treasures that can be found in the countryside. This will require collaboration between scientists, artists, gardeners, and protected-area managers.

The botanical science of China has reached a level of outstanding maturity at an international level. But the general public remains relatively ignorant of China's botanical wealth, and decision-makers are not well aware of the threats posed to the wild species by various forms of development that are affecting the country's natural heritage. Conservationists need to work more closely with scientists to ensure that the use of China's plant diversity is sustainable and that its conservation is a matter of national pride.



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加強政策對生態問題的關注：英國的情況

Getting ecology into policy: A UK perspective

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圖一：按照新計劃，經選拔的年青生態學家都會與英國生物多樣性、景觀及鄉村事務首長和其他高級政務官交流數天（左三），探討科學家諮詢的機會和制約。

Fig 1: Under a new scheme, selected young ecologists each spent several days shadowing the UK Biodiversity, Landscape and Rural Affairs Minister (third from left) and senior civil servants, to better understand the opportunities and constraints for scientists to influence policy.

公共政策对生态问题的关注，往往会受各国本身的政治、社会及学术情况而有所不同。事实上，全球的科学家及政客的关系向来都是唇齿相依。大部份的生态学家都需要依赖公共财政作为研究经费；而政府部门及机构同样需要生态研究的结果来协助制定多项政策。在英国，透过官方及非官方的系统来为科学界和政策制订者之间建立一个有效的联系。

英国的首席科学顾问 (CSA) 和科学谘询委员会 (SAC)¹ 是向政府提供科学意见的核心系统。相关的工作主要是由学者担任，尽量确保政府各部门能得到客观的科学意见。现任英国政府首席科学顾问大卫·金爵士 (Sir David King)，他是推动气候变化成为重要的政策议题的关键人物。而多个科学谘询委员会亦有生态学家的参与，共同探讨如基因改造生物及杀虫剂等问题。此外还有许多生态学家协助政府部门进行不同范畴的研究，为个别政策问题提出解决办法，如宰杀野獾是否能控制牛肺结核的传播。

大部分生态学家进行的研究都是在为政府提供科学意见的建制以外，因此需要有一个额外的系统，确保与政策制订相关的专业知识以及科技的新发展也能在政府决策过程中得到考虑。为此英国生态学会担当著仲介人的角色，透过多个活动加强科学与政策之间的接合²。

Getting ecology into public policy will vary according to the political, social and scientific arrangements of each country. However, throughout the world there is interdependency between scientists and politicians. Most ecologists are reliant on public funds to carry out their research and government departments and agencies are reliant on ecological research to shape many of their policies. In the United Kingdom, governmental and non-governmental systems help ensure that there is an effective interface between the scientific and policy communities.

At the heart of the governmental system of scientific advice are Chief Science Advisers (CSA) and Scientific Advisory Committees (SAC).¹ These positions are populated by academic researchers who spend a period of time ensuring that government departments have access to independent scientific advice. The UK Government's CSA, Sir David King, has played an important role in making climate change a high-level policy issue. Ecologists sit on a number of scientific advisory committees covering issues such as genetically modified organisms and pesticides. Many ecologists also conduct research commissioned by government departments to help answer specific policy questions, such as whether culling badgers will control the spread of bovine tuberculosis.

The vast majority of ecologists and the research they conduct are done outside of the formal structures of scientific advice. Therefore, additional systems are needed to help ensure that policy relevant expertise and scientific advances are brought into government decision-making. Through a number of activities, the British Ecological Society (BES) acts as intermediary to support the science-policy interface.²

First, the scientific community needs to understand how the policymaking process works. The BES has a number of schemes to enable academic ecologists to spend some time in Parliament and Government to see how it works. Through training schemes and guidance,³ ecologists can gain a better understanding of how to engage in the policymaking process.



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圖二：生態學家及政客首長為把生態融入英國政策而密謀對策

Fig 2: Ecologists and government ministers are seeking ways to better integrate ecology into UK government policy

首先，为了让科学家们明白决策制定的过程，英国生态学会安排了一连串的培训计划，让生态学家能到国会及政府亲身了解她们的运作。藉培训计划与指导³，让他们掌握如何才能参与政策制定的过程。

其次，须有一个讨论平台，供生态学家和政策制定人作资讯交流。曾经在一个由生态学家举办的研讨会上，一班政策制定人聚首一堂，提出一百条政策与生态相关的问题，希望生态学家日后能作出回应，而这些问题亦被转载在其中一份英国生态学会的会报上（方块1）⁴。英国生态学会更设有网志，使生态学家及政治家能得悉一些最新的动态⁵。

方块1. 擇錄自Sutherland 等⁷—在英國與政策息息相關的生態問題

先由超过650位英国的政策制定者及学术界人士提出逾千个问题，然后再由政策主导的组织在当中选出100个跟政策有高度关连的问题。以下是其中的一些例子：

生態系統服務功能

- 相对于没有受保护的陆地，受保护的生境对水资源、碳封存和其他生态功能方面能带来什么好处？

農業

- 从对生物多样性的影响和其他环境问题出发，传统农业、整合式农业管理系统以及有机农业之间的比较是怎样？

漁業、水產業及海洋保育

- 捕捞小鱼喂水产会对生物多样性带来什么影响？

休閒及野外運動

- 应根据什么生态原则来选择适合作狩猎活动之用的物种？

城市發展

- 如何在现在和未来的城市建设、城市绿地和废弃地恢复利用中给予野生动物最大程度的考虑？

外來入侵種

- 应用什么标准来确定何时需要处理外来入侵种？

污染

- 塑胶垃圾对海洋环境带来了什么影响？

氣候變化

- 那些栖息地和物种可能因气候变化而在英国完全消失？

生產能源和碳管理

- 使用生物燃料对生物多样性在野外，景观和区域层面上会带来什么后果？

保育策略

- 为什么常见蛾类的数目下降？这会引发其他类群（如蝙蝠）的数目减少吗？

生境管理與恢復

- 在郊区进行大面积保护，比起将保育工作的重心集中在特定地区的成本效益有何分别？

Second, there need to be forums where ecologists and policymakers can exchange information. A workshop organised by ecologists brought scientists and policymakers together to identify the top 100 policy-relevant questions for ecologists, which was published in one of the British Ecological Society's journals (Box 1).⁴ The BES runs a blog, which helps to keep the ecological and policy communities abreast of developments.⁵

Box 1. Ecological questions of high policy relevance in the UK – a selection from Sutherland *et al.*⁴

An initial list of over 1,000 questions was generated by over 650 policy makers and academics in the UK. From this, policy-led organisations selected 100 questions of particular relevance to policy. Examples of selected questions, on a range of subjects, are shown below:

Ecosystem services

- What are the benefits of protected habitats in terms of water resources, carbon sequestration and other goods and services, relative to non-protected land?

Farming

- How do farming systems such as “conventional,” “integrated farm management” and “organic” compare in terms of their effects on biodiversity and other environmental impacts?

Fisheries, aquaculture and marine conservation

- What is the biodiversity impact of the harvest of forage fish for the production of aquaculture foodstuffs?

Recreation and field sports

- Which ecological principles should guide the choice of the list of UK species appropriate for game exploitation?

Urban development

- How can provision for wildlife be maximised in existing, and new urban development, urban greenspace and brownfield sites?

Aliens and invasive species

- What criteria should be used to determine when to intervene to deal with invasive species?

Pollution

- What impact does plastic-derived litter have on the marine environment?

Climate change

- Which habitats and species might we lose completely in the UK because of climate change?

Energy generation and carbon management

- What are the consequences of biofuel production for biodiversity at field, landscape and regional levels?

Conservation strategies

- Why are common moths declining and are their declines driving declines in other taxa (e.g. bats)?

Habitat management and restoration

- What are the costs and benefits of concentrating conservation work on designated sites in comparison with spreading efforts across the wider countryside?

Connectivity and landscape structure

- What are the lag times between habitat fragmentation and the loss of species of different taxonomic and functional groups?



連通性與景觀結構

- 栖息地破碎化所导致不同类别和功能的物种消失的滞后时间是多少？

水域保護

- 过去和现在的铺设水底管道、移除砂粒层、栖息地破碎化、筑坝等等河岸工程，给河岸和河流内的生物多样性带来什么后果？

政策制定者一般较喜欢处理具普遍性的问题，而科学家则被训练成解答专门问题的人；而上述所提及的100个问题，正正有很多需要科学家在当中发掘出更多需要专门研究的问题。

作者总结时指出政策制定者与科学家之间实需要更多的沟通，来确保应用生态学家在处理议题的同时，能融入相关的政策措施。可以的话，应用生物学家更应强调他们工作的通用价值。

最后，科学界需要确立他们对重要生态议题的看法，并让高级的政策制定者知道他们的意见。现时英国生态学会就有关生态系统服务、气候变化及海洋环境等的问题上努力，使政策制定者能听到研究生态人士的声音。透过拟定政策文件及与重要的决策者会面，英国生态学会致力确保政府能给予生态研究适度的支持及资源投放，并妥善利用科学来协助决策。

事实上，没有单一的过程或人物能确保公共政策对生态情况作出充份考虑。因此，国家应支持一个多元化的系统，来促进生态学家与政策制定者的交流。虽然要令政策制定者将生态问题放在他们的的议程中具一定的难度；但当日后看到生态研究能有助社会面对新的挑战时，你会发现这是一件很值得做的事情。

方塊2. 生態、政治與政策 — 英國生態學會主席的一番話⁶

在最近一次的演说中，英国生态学会主席约翰·罗顿 (John Lawton) 问及该会在影响英国及欧盟的环境政策上有多成功。参照其他报告，他指出有多个可能的原因引致科学无法影响到决策者。

1. 生态学家无法将讯息清晰地传递出来—「欠缺模式」。
2. 现时有太多各式各样的科学知识，政治家不知道从那里可找到最好和最相关的资讯。
3. 由于科学的含糊性以及没有清晰的答案，就环境问题而言，存在著很多无可避免的未知数及变数，政客们往往能以此作藉口，避开作困难的决定。
4. 政客们 (正确或是错误地) 相信公众对必须付诸实行的政策并没有足够的支持；
5. 政策必须顾及到其他法定的问题及限制，这包括成本在内。
6. 政策制定者想得到简单的短期解决办法，可是生态学家的建议往往是复杂且目标长远。
7. 政客被困在两难之中：以科学为基础的政策方向，还是需要考虑其它影响力大的利益团体，如企业和支持竞选活动的慈善团体等。
8. “政制失当”— 错误的政策决定机关、缺乏“整合性”的政府及自相矛盾的政策。

Making space for water

- What have been the consequences of past and present riparian engineering works, such as weirs, culverts, gravel removal, habitat fragmentation and damming, on biodiversity within and alongside rivers?

Policy makers preferred general questions rather than narrow ones, in contrast to scientists who were best equipped to answer specific questions; many of the 100 questions selected will need to have more specific research questions extracted.

The authors concluded greater communication was needed between policy makers and scientists to ensure applied ecologists are dealing with issues in a way could feed into policy. Applied ecologists were urged to emphasise the generic value of their work where possible.

Finally, the scientific community needs to be able to develop its views on key ecological issues and have them heard by senior decisions makers. Currently, the BES is working to ensure that the ecological community informs policy decisions regarding ecosystem services, climate change and the marine environment. It also works to ensure that Government properly invests in ecological research and appropriately uses science in its decisions. We are doing this by producing policy documents and meeting with key decisions makers.

There is no one process or actor that can ensure that ecology informs public policy. Therefore, countries should look to support a diverse system for enabling interactions between ecologists and policymakers. Working to ensure that ecology is taken into consideration by policymakers can be challenging. But it is also rewarding to see ecological research helping to meet the challenges facing society.

Box 2. Ecology, politics and policy – extracts from a Presidential Address.⁶

In a recent Presidential Address, British Ecological Society (BES) President John Lawton asks how successful the BES has been in influencing UK and EU environmental policy. With reference to other papers, he notes there are many possible reasons science is unable to influence policy-makers:

1. Ecologists are failing to get the message across clearly enough (the ‘deficit model’).
2. There is too much science out there, and politicians do not know where to go for the best or most relevant information.
3. The science is ambiguous and there are no clear answers, allowing politicians to avoid difficult decisions because of the inevitable uncertainty and variability surrounding environmental issues.
4. Politicians believe (rightly or wrongly) there is not sufficient public support for what ‘ought’ to be done.
5. Policy must take into account many other legitimate issues and constraints, including cost.
6. Policy-makers want simple short-term solutions; ecologists offer complex and long-term advice.
7. Politicians are caught between the science-based policy options and other powerful interest groups – industry, campaigning charities etc.
8. ‘Institutional failure’ – the wrong decision-making bodies, lack of ‘joined-up’ government and contradictory policies.

9. 解决方案需要得到国际的协定，令单方面的行动往往不符合经济原则。
10. 科学意见与现行的政策意见互相违背。
11. 个别政客贪污腐败。

约翰直言科学家一般倾向相信「欠缺模式」，认为只要将从科学中得到的启示告知政策制定者，「正确」的政策便能随之而产生；但事实上情况并不是这样。好像在英国及其他欧洲国家，对政府就有关环境政策的问题，大多数情况下生态学家都必须不厌其烦地一再争取，才能发挥他们的影响力。要从根本改变政治人物的信念、价值观以及标准，这绝对是一个极度缓慢的过程。约翰最大的忧虑是这个过程实在是太慢，赶不上地球生物多样性消失的速度。

9. The solutions require international agreement, such that unilateral action is economically disadvantageous.
10. The scientific advice contradicts prevailing political opinion.
11. Some politicians are corrupt.

He contends that scientists tend to adhere to the 'deficit model' explanation, believing that if only politicians are told what the science reveals, 'correct' policies will follow. But this is often not the case. The influence of ecologists on UK and European government policy on the environment often occurs via complex and iterative interactions. These can be extremely slow, involving fundamental changes in politicians' belief systems, values and norms. His deepest concern is that the influence is too slow to keep pace with the unravelling of the "fabric of the planet" (biodiversity).

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退而不休的韋發南教授—植物世界的引路人

Professor Wei Fanan – champion of lifelong learning and botany

由朱詠賢訪問及撰文
Interviewed and written by Wylie CHU

韋發南教授自1962年開始在中科院廣西植物研究所工作，40多年來一直從事植物分類、植物區系地理和植物資源持續利用研究，命名植物新分類群50餘個。曾作為骨幹參加華南地區多次大型自然資源綜合考察，對華南地區植物分類及植物資源保育等方面有較深入研究。

Professor Wei Fanan has served Guangxi Institute of Botany since 1962 in the fields of plant taxonomy, floristic geography and sustainable use of plants, and he has described over 50 new plant taxa. He has been a core member of large-scale comprehensive surveys in the South China region, giving him deep insights on plant taxonomy and conservation.

七月初在桂林跟韦教授见面时，他刚从靖西考察回来，与广西植物研究所的同事去进行一个有关端午节药用市场的调查，这一趟他们记录到上市的有300余种中草药，并在随后的野外考察中发现了秋海棠属植物1个新种。

其实韦教授已于2001年退休，但直到现在，他每天仍会回办公室，看标本、写文章，还有解答很多前来向他请教有关植物问题的人，偶尔也会应邀到野外考察，反映他热爱他的专业和工作，退而不休。对他来说，这绝对不是一份工作，而是他对植物世界的热爱和追求，当中乐趣无穷！

「年青体力比较好的时候，尤其40岁以前，每年都有一半的时间在山上跑！」现年67岁的韦教授笑说著。所以广西的大山韦都有留下他的足印，像大明山、大瑶山、金鍾山、九万山、花坪、弄岗等，他最少去过5、6趟。就是因为这样，韦教授除了是一位鉴定植物的高手外，对植物在野外的生长情况和分布，亦有深入的了解，这全都是一点一滴的累积起来。

大瑶山上的第一次

韦教授从小就对植物有著浓厚的兴趣。「我是壮族人，在农村长大，从小就看到人家利用不同的植物来医病，很感兴趣，觉得真是很了不起。」于是从生活的趣味开始，逐渐走进多姿多彩的植物世界。



韋發南教授攝於辦公室
Prof. Wei Fanan in his office.

When I met Prof. Wei in early July, he had just returned to Guilin from Jingxi where he joined a survey of the Duanwu festival medicinal herb market with colleagues from the Guangxi Institute of Botany. They found about 300 types of traditional Chinese medicines on sale at the market, and also discovered a new *Begonia* species during a field survey.

Despite having retired in 2001, Wei is industrious. He still gets to work every day to identify specimens, write research papers, answer plant-related queries, and occasionally join field trips upon others' invitation. He is wholeheartedly devoted to his profession. To him, these tasks are no longer a job, but his passion in pursuit of the botanical world.

“When I was young and more energetic, particularly before I was 40, I spent half of my time exploring the mountains,” said Prof. Wei, who is now 67. His footprints were left all over the great mountains of Guangxi, including Damingshan, Dayaoshan, Jiuwanshan, Jinzhongshan, Huaping, Nonggang and so on. He has visited these sites at least five or six times. Thus he has not only become a renowned authority in plant identification, but is also highly familiar with the distribution and biology of the plants in the wild.

First trips to Dayaoshan

Wei was very interested in plants even as a child. “I grew up in a village of the Zhuang minority tribe, where I often saw the village people using plants for medical treatment. It was amazing! I wanted to find out more and more about plants.” Finding traces of fun in daily life, Wei gradually became part of this fascinating botanical world.

But he hardly thought about plant conservation, or forest protection, until 1964, when he needed to study the trees of Dayaoshan in search of wild tree species suitable for planting in

华南保育先驱

Conservation Pioneers in South China

但至于什么叫做植物保育以及保护森林等问题，他从来也没有想过，直到1964年到大瑶山进行一次名为「城镇绿化野生树种」的调查。「那是我第一次爬大山，我从来也没有看过这么大的树！自己单独在山里头，大树都是密密麻麻，这些都是我在村里头没有看过的。」那一次他们发现很多树被砍了，估计是因为1958年的全民「大炼钢铁」运动时被砍的，很多砍下的木材都烂了，韦暗村十分可惜。

第二年再去大瑶山考察，发现森林破坏的情况更加严重，一直往森林中心部位发展，慢慢砍过去。「很多大树也没有了！我开始想怎么可能这样，这不是很快就砍光了！我开始对森林保育有一些概念，知道必须要保护森林。」从那时候开始，韦每一次到不同的森林考察时，他都会跟当地人交流，解释保护森林的重要性，希望他们能好好保育她，但发现这是一件很困难的事。

靠山 吃山 不养山

几千年以来，老百姓都是这样习惯地取之自然，觉得顺理成章；以前人口少，就算砍也是有限；但现在人这么多，对森林的破坏就很大！

韦教授一口气举了几个他在野外考察时看到让他心痛极的例子，其中一个「小屯」的情况令他印象特别深刻。「第一次去的时候，感觉那里非常舒服，有20多家人，还有很多枫香树及其他大树。18年后我再去，已面目全非，所有树都被砍完，连可以用来作柴火的都没有，现在他们困难到一个地步，每天需要用马到10-15多公里外的地方把柴火运回来。」韦教授感慨的说。

但根据韦的观察，透过宣传教育的工作，近年的情况已慢慢改善，大家开始了解到是不能再这样砍树了，树被砍了，鸟没有了，水也没有了；此外执法方面也做得比以前好。

「靠山吃山不养山，一直以来我们都没有种树的习惯，砍完就算，这是最大的问题。」韦教授还强调「珍惜资源，不要浪费」的重要性，要用多少就拿多少，千万不要以为是永远砍不完，拿回来以后又不用。韦所说的，不就是现在我们挂在嘴边的「可持续发展」的概念吗？而韦教授正是几十年来持续不断地在实践著。

对森林的破坏，还有毁林开荒的问题，韦教授担心这会后代做成极大的遗憾。「原来地方的树长得好好，但就把它砍光，烧山毁林，然后种上另一作经济树种。」韦教授指出当中最大的问题是由于管理不善，领导不懂科学，然后项目都失败了，其中一个例子是有一片面积约50到60公顷的树林，他们把野生的栓皮栎和其他树都砍掉，然后种杉木。

「这个失败了！他们要知道每一个树种也要不同的生态条件，杉木是需要酸性土的，但他们就把杉木种在石灰岩山上，石山的土壤是硷性到中性的。」韦教授解释。这样一片林就没有了，破坏很容易，要恢复原貌困难就很大。

基础研究的重要性

以上的例子说明基础研究的重要性，纵使一直以来比起濒危物种的保育、环境政策制定等的研究，人们对基础

the city. “This was my first time going into a big forest. I had never seen such giant trees! When I was alone in the mountains, I found there were so many trees all around that were not available in my home place,” Wei said. But at the same time during the study, a lot of trees were found logged, probably due to the “Iron and Steel Making Drive” launched in 1958. Wei felt sorrow about the logging, as much timber was left to rot.

Wei paid another visit to Dayaoshan the following year, and the forest destruction was a lot more serious, with logging expanded towards the centre of the forests. “So many large trees were gone! It came to my mind that the forests could not be logged anymore.

I started developing some basic concepts of forest conservation, and knew that we must do something to protect the forests.” Ever since then, whenever conducting field surveys Wei will talk to the local people, and explain the importance of forest conservation, in the hope that they will better conserve the forests. But it is always a tough task.

Relying on mountains for resources

Local villagers are used to getting resources from the wild, and can take them for granted. In the past nature may have been able to sustain the population, which was far smaller, hence logging was limited. “But now the population is huge, and forest destruction on this scale will be disastrous!” Prof. Wei said.

He also mentioned some heart-breaking examples encountered during his surveys, and the situation of one small village struck him most. “It was a very comfortable place, with a lot of large trees surrounding some twenty households. When I returned there after 18 years, it was no longer a nice place, as all the trees, and even the firewood, were gone. Now each day they need horses to transport firewood from 10-15 miles away for their daily use,” he sadly said.

But Wei found the situation has been getting better in recent years through education campaigns. People know they should not destroy the forest any more. When there are no trees, there are no birds, and no water either. Besides raising awareness, law enforcement has also been improved.

“Regrettably, our heavy reliance on mountains has never fostered in us a habit of tree planting. This is the major problem.” Wei reiterated the importance of “wise and economical use of resources”: we should not take more than enough; we must be clear that the forest resources are limited; and no precious resources should be wasted. These beliefs coincide with the prevailing concepts of “sustainable development”.

Forests are subject to various kinds of damage as well as clearance. Wei believes all these mean trouble for the next generation. “The trees in the wild were strong and healthy, but then were logged, burnt and cleared, so as to plant a few other tree species as economic crops.” He points out that this situation is getting even worse due



韋教授於2003年參與一個關稀有瀕危植物的調查
In 2003, Prof. Wei helped to conduct a survey of rare and endangered plants

相片由韋發楠提供 Photo by Prof. WEI Fanan



研究的重视程度不高，政府的支援亦不大，但事实上是与我们的生活息息相关。从韦教授的讲解得知，植物分类研究一直跟农林医药等方面之间的关系非常密切。

「好像刚开发绞股蓝的时候，有人想办一个规模很大的工场，由于他们不认识，他们会来跟我们了解一下：广西有什么种类？长在什么地方？一年能够采多少？然后才可决定工场办多大。」还有很多大大小小的例子，主要是跟植物用途的开发有关，很多人会向韦教授请教：「这个东西很有用，我想去生产，但不知是什么？那一科？那一个属？有没有毒？在什么地方找得到？」

除此之外，韦教授有时候还会提供「另类」的支援。「公安会来找我协助查案！」韦笑著说。原来是有关贼人留下来的一些「植物」线索，曾经试过是兰花，也有花粉；他们会拿来给韦教授鉴定：首先确定是什么植物？跟著是它的分布是怎样？如果鉴定出来是外来的品种，便能初步估计出贼人是从外地来的，将调查范围确定，缩短破案时间。还有就是有吃野菜中毒的人，有时候当局也会拿来给韦教授鉴定一下，然后便能通知医院，对症下药。「能够将植物分类的知识应用在不同的地方，我觉得挺有意思！」

凭藉锲而不舍的精神和不断的探究，韦教授更破解了不少植物世界的「悬案」，其中一个例子是有关驰名中外的楠木。「自19世纪英国人A.D avenport 在Kew Report报导了关于中国楠木的消息后，楠木的名称开始在植物学界造成混乱。百馀年来，名称一再变更，莫衷一是。」韦教授说。

直到1988年韦教授得到英国皇家植物园的大力支持，给予借用19世纪的模式标本，才使这个混乱了百馀年的名称得到澄清。此外，在2006年韦教授跟他的同侪就关于樟科润楠属和颞梨属的分界线模糊不清的问题，亦作出了一个厘清。

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好學不倦 用心工作

要有韦教授一样的功力，绝非一朝一夕的事，需要数十年的实践和积累才能达致。「那么要做好植物分类研究需要什么条件？」很自然地问他。

「必须要对这方面感兴趣，除分类学基础外，还要努力学习相关的学问如遗传学、生态学、地理学等，以及有丰富的野外实践经验。」韦教授细细道来。还有一项秘诀，就是要学好外语。「植物分类学是在上个世纪20年代从西方国家传入中国，所以很多相关的资料大多是英

to improper management. Some leaders are not acquainted with scientific knowledge and this is the main reason for the failure of plantation projects. For example, in one patch of limestone forest of about 50-60 ha, loggers cleared all the Chinese Cork Oak (*Quercus variabilis*) and other trees as a new planting site for fir. “This simply didn’t work! People had no idea of the ecological needs of each tree species. Fir trees need acidic soil, but they plant them on limestone hills, which are unacceptably as the soil is alkaline to neutral,” Wei explained. “The forest can be easily destroyed but if we want to re-establish it, it demands a vast amount of effort.”

Importance of basic research

The above cases show how important basic research is. Government support remains low, yet this, as a matter of fact, is closely related to our daily lives. Wei further explained that research on plant taxonomy has contributed greatly to agroforestry and medicinal use of plants.

“Upon the first discovery of the medicinal value of Five-leaved Gynostemma (*Gynostemma pentaphyllum*), someone was interested to set up a large-scale farm, but they knew nothing about it. They approached us to ask about its distribution, growing rate, harvest per year etc. before they could plan this operation,” Wei said.

There are many similar cases, primarily related to plant utilisation. Frequently questions posed to Prof. Wei include: “This species is so useful and I’d like to grow more. Can you tell me more about its background?” “Which family and genus does it belong to?” “Is it toxic?”

“Where else I can locate it?”

Sometimes, Wei provides “alternative” advice. “Police will get clues from me during their investigations,” Wei laughed. On occasion there are plant-related traces left at crime scenes, such as orchids and pollen grains. Police will bring them over for Wei’s identification and relevant information such as their distribution, which can be relevant to the investigation. It might be that if the plant does not grow locally, suspicion shifts from local people to someone from elsewhere. This can definitely help narrow down the investigation. “If there are cases of food poisoning because of wild vegetables, the authorities will also pass me the samples for identification and ask for necessary information to assist the doctors in the treatment. It means a lot to me that my taxonomic knowledge can be applied in different fields and help people,” Wei said.

With persistent exploration and work, Prof. Wei has resolved many “cold cases” of the botanical world. An example concerns the valuable tree *Persea nanmu*. “In the 19th Century, Mr A. Davenport, a Briton, reported in the Kew Report about the first discovery of *Persea nanmu* in China. Since then, the species has caused confusion in the academic world for more than a hundred years. Its name was revised again and again but we still didn’t have a consensus,” Wei recalled.

In 1988, with the loan by the Royal Botanic Gardens of the type specimen collected in the 19th century, Prof. Wei eventually clarified the name as *Machilus nanmu*. In 2006, together with colleagues he circumscribed the related genera *Machilus* and *Persea* (Lauraceae).



韋教授希望能引領年青一代從事植物方面的研究
Prof. Wei enjoys helping younger generations to explore the botanical world

相片由韋發福提供 Photo by Prof. WEI Fanan

语或其他语种。为了能更加透彻了解个中的精髓，我48岁那年还去学外语，现在基本可以应付工作上的需要。」韦教授谦虚的说。

跟韦教授的倾谈中，你会很强烈的感受到他那从不间断追求知识的热情，真的很值得我们敬服！最后韦教授还跟我们分享他的两个心愿：「广西的植物资源非常丰富，全中国排行第三，仅次于云南和四川，而当中石山(石灰岩山)植物的种类也特别繁多。希望能成立一个专门的石山植物标本室，这样将来从事石山植物的研究人员，便能在这里找到比较全面的资料。」

还有的是关于石山跟土山植物的比较。「有些植物只能在石山找到，有些则能同时在石山和土山上生长，主要是跟土壤的成份有关，我已有初步的想法，希望能去了解多一些……」一面听韦教授说著，心里面油然感到一股久违的力量一想起自己从事环境教育只有数个年头，但很多时候看到自然环境不断被破坏，以及人与人的关系日益疏离，都会感到气馁，觉得以小小的力量，无法改变任何事情。跟韦教授的一席话，强烈地感受到他对植物世界的专注和热爱，这让我重新反思，环境保育并不是一大道理，只需要每个有心人在其专注范畴的参与和努力，这样，不同专业的人去拼合一块，无论大小，为保育出一分力。那样，便能拼出越加完满的图象。

後記

除了在办公室做访问，我还有幸跟著韦教授在植物园走了一圈，在短短几小时里，我仿佛经历了一次向植物世界的深度游。由韦教授带领著，我不单广泛认识了这个国度的丰富多姿，更加了解到人与自然之间多层次的密切关系；对我这个门外汉，真的是一次奇妙的旅程，著实获益不浅！

而韦教授的学生和其他考察人员都异口同声说，如果可以的话，他们都希望能与韦教授一起上山考察，因为韦教授有著非常丰富的经验。而韦教授亦很乐意这样做，引领及扶携年青一代，让他们接好棒，继续为这门基础科学探索，积累宝贵的知识和经验。

〔非常感谢刘演老师的安排和协助，才能顺利完成这次访问。〕

Unflagging persistence

It is not easy to reach the knowledge level of Prof. Wei. What are the essential criteria to be engaged in plant taxonomic study?

“You must be interested in it. Then, you need to work hard on related subjects and domains which include plant genetics, ecology and geography etc. Thirdly, practice in the wild of course makes perfect,” Prof. Wei answered.

And there is one more tactic - have a good command of foreign language. “Plant taxonomy was introduced to China only in the last century, while many relevant materials were written in English or other western languages. To grasp the essence of these materials, I started to learn English when I was 48. I’m not very good but am somehow able to use it for my daily work,” Wei said modestly.

Wei’s unrelenting and ardent pursuit of lifelong learning is truly worth respecting. He also shared with us two more wishes. “Guangxi is rich in plant species, ranking third in China after Yunnan and Sichuan, while limestone hills are of special importance among other landscapes. I am really hoping to establish a herbarium specifically for limestone plants. This will be particularly useful for researchers engaged in this field in the future since a more comprehensive resource could be created in such a herbarium.”

Another is about the study of the plants on limestone hills. “Some plants can only be found on limestone hills, while some can grow on either limestone or other hillside areas. My focus is particularly related to the soil components. I have already developed some preliminary thoughts and I would like to explore more,” said Prof. Wei.

An inspiration

Prof. Wei’s words have awoken some long-lost power in my heart. I’ve been working in the field of environmental education for only a few years, but have become discouraged by the continual environmental destruction, and the way our relationship with nature is getting more and more distant. Wei’s concentration and passion towards the botanical world, made me realise that environmental protection is not only a conceptual ideal. It is something that requires every single person to focus on his or her own capacity, and then work together. With pooled efforts and contributions to environmental conservation, a rosy outlook can be envisaged.

Both his students and other researchers like to have Prof. Wei on field surveys with them if possible, for his experience, knowledge and teaching ability. “It’s my pleasure,” he says, “to guide and foster the younger generations, so that they will keep on exploring the botanical world and hence build up more experience and technical knowledge.” From its seeds in a Zhuang village, his passion now casts quite a shadow.

(Special thanks to Mr Liu Yan for his thoughtful arrangement and assistance during the interview.)



海南島淡水龜物种多樣性調查

Report on the Freshwater Turtle Survey on Hainan Island

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近几十年来, 由于受传统医药、饮食、捕猎、贸易以及栖息地破坏等因素的影响^{1,2}, 我国龟类资源遭到严重破坏, 物种普遍濒危^{2,3}, 开展龟类的科学研究和保育工作显得非常迫切。海南岛是我国淡水龟类物种最丰富的地区之一, 同时也是淡水龟类资源破坏较严重的地区^{4,5}, 有关海南岛淡水龟类物种多样性的问题还存在争议^{6,7}, 因此, 开展海南岛淡水龟类的科学研究和保育工作具有重要意义。2001-2006年期间, 在香港嘉道理农场暨植物园 (KFBG) 和国家自然科学基金 (30260019) 的资助下, 我们对海南岛淡水龟类进行了调查研究。

海南島淡水龜類物种多樣性研究現狀與爭議

自19世纪90年代, 国外学者开始对海南岛淡水龟类进行研究。1894年, Boettger依据海南岛标本发表新种 *Clemmys schmackeri*, 这是海南岛淡水龟类的最早记载, 后来发现 *C. schmackeri* 是黄喉拟水龟 *Mauremys mutica* 的异名⁸。1906年, Siebenrock依据海南岛标本发表新种山瑞鳖 *Palea steindachneri*, 同时还报道有花龟 *Ocadia sinensis* 与中华鳖 *Pelodiscus sinensis* 分布⁸。1913年, Vogt记载海南岛有花龟、黄喉拟水龟、山瑞鳖和中华鳖⁸。1927年, Schmidt报道海南岛龟类共3科7属9种⁸, 新增加了平胸龟 *Platysternon megacephalum*、眼斑水龟 *Sacalia bealei*、三线闭壳龟 *Cuora trifasciata*、锯缘摄龟 *Pyxidea mouhotii* 和鼈 *Pelochelys cantorii*。1935年, Pope指出⁸, 从Schmidt所绘制的眼斑水龟图来看, 应该是四眼斑水龟 *S. quadriocellata*。1934年, Taylor报道海南琼海有花龟、黄喉拟水龟、山瑞鳖和中华鳖⁸。1935年, Pope报道海南岛的淡水龟类共9种⁹, 即平胸龟、三线闭壳龟、四眼斑水龟、花龟、锯缘摄龟、黄喉拟水龟、中华鳖、山瑞鳖和鼈。

20世纪50年代以后, 我国学者开始对海南岛淡水龟类进行调查研究。1958年, 李致勋报道海南岛龟类3科6属10种¹⁰, 包括两个新亚种, 即黄缘闭壳龟海南亚种 *Cyclemys flavomarginata hainanensis* 与灰顶六眼龟 *Clemmys bealii quadriocellata*, 灰顶六眼龟后来被证实是四眼斑水龟的异名⁸。1975年, 赵尔宓以黄缘闭壳龟海南亚种与黄缘闭壳龟差别显著, 将其上升为新种, 移入闭壳龟属 *Cuora*, 称为海南闭壳龟 *C. hainanensis*⁸。1987年, 赵尔宓进一步提出海南闭壳龟实为黄额闭壳龟 *C. galbinifrons* 的异名¹¹。1990年, 赵尔宓报道眼斑水龟和地龟 *Geoemyda spengleri* 在海南岛有分布¹², 但并没有得到广泛认同, 一些权威著作不认为地龟在海南有分布¹³。近些年关于海南淡水龟的调查, 没有发现任何证据可以说明眼斑水龟在海南的分布^{5,17}, 因此一些学者怀疑眼斑水龟在海南的分布。2005年, 史海涛报道在海南琼中发现地龟¹³, 才明确证实地龟在海南岛的分布。1992年, Iverson & McCord^{14,15}根

In the past few decades the combined impacts from traditional medicine, consumption, harvesting, trade and habitat loss have dealt a serious blow to turtle populations and driven many species to the brink of extinction in China^{1,2,3}. This dire situation calls for urgent action in both research and conservation. Hainan is one of China's hotspots of freshwater turtle diversity, and faces proportionate conservation challenges^{4,5}. In addition there is controversy over the taxonomy of Hainan's turtles^{6,7}. For these reasons a field inventory was conducted during 2001-2006, with funding from Kadoorie Farm & Botanic Garden (KFBG) and a grant from the National Natural Sciences Foundation (NNSF: 30260019).

Species of freshwater turtles in Hainan and controversies

The study of freshwater turtles in Hainan was initiated by foreign scholars back in the 1890s. In 1894, Boettger described a new species, *Clemmys schmackeri*, based on specimens collected from Hainan. This is the earliest record of a freshwater turtle in Hainan. It was later discovered that *C. schmackeri* was a synonym for the Asian Yellow Pond Turtle *Mauremys mutica*⁸. Another new species, the Wattle-necked Soft-shelled Turtle *Palea steindachneri*, was described by Siebenrock in 1906 based on specimens collected from Hainan. He also reported the presence of Chinese Stripe-necked Turtle *Ocadia sinensis* and Chinese Soft-shelled Turtle *Pelodiscus sinensis* in Hainan⁸. Vogt confirmed the presence of *O. sinensis*, *M. mutica*, *P. steindachneri* and *P. sinensis* in Hainan in 1913. Schmidt expanded the list to nine species in 1927 by adding five new species: Big-headed Turtle *Platysternon megacephalum*, Beale's Eye-spotted Turtle *Sacalia bealei*, Chinese Three-striped Box Turtle *Cuora trifasciata*, Keeled Box Turtle *Pyxidea mouhotii* and Asian Giant Soft-shelled Turtle *Pelochelys cantorii*⁸. In 1934 Taylor again reported the presence of *O. sinensis*, *M. mutica*, *P. steindachneri* and *P. sinensis*, all at Qionghai, Hainan⁸. The following year Pope⁹ listed nine species of freshwater turtles in Hainan; his only departure from earlier interpretations was in arguing that the picture of Eye-spotted Turtle drawn by Schmidt looked more like the Four-eye-spotted Turtle *S. quadriocellata*.

Chinese scholars began to study Hainan's freshwater turtles in the 1950s. Li Zhixun¹⁰ reported ten species in six genera in 1958, including the new subspecies *Cyclemys flavomarginata hainanensis* (his *Clemmys bealei quadriocellata* was a synonym of *Sacalia quadriocellata*).⁸ In 1975 Zhao Ermi upgraded *C. flavomarginata hainanensis* to a new species and re-classified it as *Cuora hainanensis*, noticing obvious differences from *C. flavomarginata*⁸. But in 1987 he came to consider that *C. hainanensis* was just a synonym of the Flowerback Box Turtle *C. galbinifrons*¹¹. His report of *Sacalia bealei* and Black-breasted Leaf Turtle *Geoemyda spengleri* in Hainan in 1990¹² failed to gain full support.¹³ In recent work on the turtles of Hainan, no evidence of the occurrence of *S. bealei* was



圖一、二：捕龜用的竹籠（左）和陷阱
Fig 1,2: Turtle traps being used in the

据海南东方县市场上的标本发表新种拟眼斑水龟 *S. pseudocellata*¹⁴ 和黄额闭壳龟锯缘亚种 *C. galbinifrons serrata*¹⁵。1992年, McCord & Iverson根据海南岛东方县市场上的标本发表菲氏花龟 *O. philippeni*¹⁶。1999年 de Bruin & Artner¹⁷ 针对拟眼斑水龟和菲氏花龟, 在海南岛进行了为期10天的调查, 在市场和乡村发现了6种400多只野生淡水龟, 但未发现拟眼斑水龟和菲氏花龟。2005年, 赵尔宓发表了他1964年在海南岛8个月的调查结果, 发现淡水龟类10种, 也未发现拟眼斑水龟和菲氏花龟¹⁸。

2001年, Parham等⁶通过基因研究, 发现黄额闭壳龟锯缘亚种是锯缘摄龟与黄额闭壳龟的杂种。2003年 Dalton⁷发表在《Nature》杂志上的文章认为拟眼斑水龟和菲氏花龟也可能是杂种。2006年, Stuart & Parham¹⁹通过基因研究, 证实拟眼斑水龟是三线闭壳龟和四眼斑水龟的杂种, 菲氏花龟是花龟和三线闭壳龟的杂种。

海南島淡水龜類物種多樣性調查結果

本研究采用走访调查、市场调查和野外调查相结合来开展工作。走访调查的行政区包括海南18个市县103个乡镇和200多个自然村。野外调查选择黎母山、南茂岭、尖峰岭、霸王岭、万俄岭、文教河上游以及南渡江上游等7个研究点, 采用系统抽样方法、陷阱法和笼捕法进行调查。

走访调查和市场调查中发源于海南岛有分布的野生淡水龟类共10种507只, 包括86只黄额闭壳龟、41只地龟、182只锯缘摄龟、20只平胸龟、83只四眼斑水龟、16只中华鳖、6只三线闭壳龟、8只黄喉拟水龟、61只花龟和4只山瑞鳖。野外调查共在7个地区, 通过5,400陷阱日和8,757个笼捕日的调查, 共捕获淡水龟5种56只, 其中包括4只黄额闭壳龟、2只锯缘摄龟、10只平胸龟、39只四眼斑水龟和1只中华鳖。另外, 在琼中南茂村发现“黄额闭壳龟锯缘亚种”1只, 该龟来源于当地野外环境, 研究发现该个体是锯缘摄龟与黄额闭壳龟的杂种²⁰。

调查中没有发现鼋, 但从访问获得的许多间接证据也表明了鼋的历史分布和数量状况, 可能仍然存在一定数量的鼋种群²¹。就眼斑水龟而言, 则既没有发现实体, 也没有访问的间接证据可以证明野外有分布, 相关文献并没有给出确切的分布地点和标本来源¹², 关于眼斑水龟在海南岛的分布问题还值得怀疑。综合文献和本次调查研究结果, 笔者认为, 海南岛确切有分布的淡水龟类包括11种, 即平胸龟、三线闭壳龟、黄额闭壳龟、黄喉拟水龟、锯缘摄龟、地龟、四眼斑水龟、花龟、中华鳖、山瑞鳖和鼋, 而拟眼斑水龟、菲氏花龟和黄额闭壳龟锯缘亚种为杂种。

海南島淡水龜類面臨的威脅與保育建議

调查发现, 海南岛所有的18个市县都不同程度地存在野生龟类贸易⁵。发现有野生龟类贸易的农贸市场22个, 占调查农贸市场总数的19.6%; 有野生龟类贸易的乡镇64个, 占调查乡镇总数的62%; 野生龟类收购点103个。贸易导致了野生淡水龟类的过度猎捕^{4,5}。淡水龟市场价格较高, 对经济不发达地区的村民具有很大的诱惑力, 绝大多数猎捕淡水龟的村民捕龟的目的是出售而非自己食用⁴。非法猎捕淡水龟的现象在海南岛普遍存在, 保护区外的淡水龟类因遭到过度猎捕而近乎绝迹, 保护

found^{5,17}。The presence of *G. spengleri* in Hainan was not confirmed until its discovery by Shi Haitao at Qiongzong in 2005¹³。

Based on specimens collected from a market in Dongfang County, Iverson and McCord described a new species, False Eye-spotted Turtle *Sacalia pseudocellata*¹⁴, and a new subspecies *Cuora galbinifrons serrata*¹⁵ in 1992. The same year they described another new species, Philippen's Stripe-necked Turtle *Ocadia philippeni*¹⁶, based on a specimen collected from the same market. A ten-day survey focusing on *S. pseudocellata* and *O. philippeni* was carried out in Hainan by de Bruin and Artner in 1999, recording more than 400 individuals in six species but failing to spot the two target species¹⁷. In 2005 Zhao Ermi published the results of his eight-month Hainan survey carried out back in 1964. He recorded ten species of freshwater turtle in that survey but failed to find those two elusive species as well¹⁸. Based on genetic evidence, in 2001 Parham *et al.*⁶ suggested that *C. galbinifrons serrata* was a hybrid between *P. mouhotii* and *C. galbinifrons*. Dalton⁷ claimed in a paper published in *Nature* in 2003 that both *S. pseudocellata* and *O. philippeni* are likely to be hybrids. In 2006 Stuart and Parham¹⁹ used genetic evidence to prove *S. pseudocellata* was a hybrid between *C. trifasciata* and *S. quadriocellata*, while *O. philippeni* was the result of hybridisation between *O. sinensis* and *C. trifasciata*.

Results of the recent Hainan freshwater turtle survey

The present survey used a combination of interviews, market surveys and field surveys. The study covered more than 200 villages in 103 towns in all the 18 county-level administrative units in Hainan. Field survey was carried out at seven study sites, at Limushan, Nanmaoling, Jianfengling, Bawangling, Wan'eling, and the upper reaches of the Wenjiao and Nandu Rivers. Methodology included systematic sampling, pitfall traps, and cage traps^{5,23}.

The market surveys recorded 507 individuals of freshwater turtles of ten species: 86 *C. galbinifrons*, 41 *G. spengleri*, 182 *P. mouhotii*, 20 *P. megacephalum*, 83 *S. quadriocellata*, 16 *P. sinensis*, six *C. trifasciata*, eight *M. mutica*, 61 *O. sinensis* and four *P. steindachneri*. A catch effort of 5,400 pitfall days and 8,757 cage days at the seven field sites produced 56 turtles of five species: four *C. galbinifrons*, two *P. mouhotii*, ten *P. megacephalum*, 39 *S. quadriocellata*, and one *P. sinensis*. In addition, an individual of "*Cyclemys flavomarginata hainanensis*" was obtained from Nanmao Village, Qiongzong County. It was collected from the field and was later proved to be a hybrid between *P. mouhotii* and *C. galbinifrons*²⁰.

The survey failed to find *P. cantorii*, though circumstantial evidence from interviews throws light on its previous distribution and abundance, suggesting the possibility that a wild population survives²¹. For *S. bealei* no evidence, either sightings or indirect evidence from interviews, suggested its present existence in the wild, and the previous literature failed to pinpoint the location and origin of specimens¹². It is, therefore, still debatable whether Beale's Eye-spotted Turtle lives in Hainan.

Threats and conservation recommendations

This survey confirmed the existence of a trade in wild turtles to varying degrees in all the 18 counties and cities across Hainan⁵. Wild turtles were traded in 22 markets: 20% of those surveyed. Of 103 towns we found turtles traded in 64 (62%). In addition, this survey identified 103 purchasing stations where turtles are purchased. The trade results in the widespread over-exploitation of wild freshwater turtles^{4,5}. The relatively high price obtainable is highly attractive to the local villagers where economic development is relatively backward. Most freshwater turtles hunters hunt for sale rather than their own consumption. The pervasive and rampant illegal collection has driven turtles to the brink of extinction outside nature reserves and decimated them within^{22,23}. Numerous traps for freshwater turtles, new and old - mainly hooks, bamboo cages and pitfall traps - were



照片由作者提供 Photo by Author



区内的淡水龟也遭到严重盗猎^{22,23}。在部分自然保护区的调查发现，自然植被保存完好，但溪流中有大量的新旧程度不同的盗猎淡水龟装置，主要包括钓钩、竹笼和陷阱，而淡水龟的数量却非常稀少²³，显然盗猎淡水龟的活动长期存在。调查表明，非法猎捕和贸易是海南淡水龟类面临的巨大威胁。

此外，栖息地破坏在一些地区也对淡水龟类造成致命的威胁，如海南中部山区的南茂岭地区，该地区淡水龟类物种丰富，自然植被良好，但由于这些地区没有建立自然保护区，当地居民肆意砍伐山上的次生植被，烧山后种植农作物，破坏了淡水龟类的栖息地，严重威胁当地淡水龟类的生存²²。



圖三：保護區員工於野外沒收捕龜陷阱
Fig 3: Reserve staff are confiscating turtle traps in the wild.

依據調查研究，我們提出4點保育建議：

- (1) 加强对非法猎捕和贸易的管理—野生动物保护管理部门需要加强对城市野生动物贸易场所、经营野生动物的饭店进行检查，对不法分子依法进行严肃查处。加强对小城镇和乡村地区的管理和执法检查力度，对非法收购、贩卖野生动物的场所进行摸底，并坚决取缔，对不法分子进行严肃查处。建立举报奖励制度，设立举报电话，积极利用公众的监督作用来促进管理。
- (2) 加强淡水龟类栖息地的保护—自然保护区内的淡水龟类栖息地已经得到较好保护，但非保护区的淡水龟类栖息地仍然不断遭到破坏，林业部门要加强对非法砍伐次生植被，烧山等活动的管理，对于需要建立自然保护区的地区尽快考虑建立自然保护区。
- (3) 完善自然保护区的保护管理工作—海南的许多自然保护区是淡水龟类的重要栖息地，但是目前的保护管理水平还不能有效防范对淡水龟类的盗猎。建议保护区巡逻人员要加强对溪流等淡水龟类栖息的环境进行巡察，及时发现和销毁盗猎者布设的盗猎装置，使其无机可乘。积极同科研机构合作，开展保护区龟类资源调查，采用标记重捕法来监测龟类种群数量变化，并把龟类种群数量变化作为评价和考核保护区保护管理成效的重要指标。
- (4) 开展科学研究和贸易监测工作—科学研究是保护管理工作的基础和依据，需要继续开展淡水龟类的资源调查、生态学和保护生物学研究。管理部门需要和科研机构合作，长期开展龟类贸易监测工作，了解非法贸易动态，通过监测来检验保护管理的效果，发现存在的问题，不断完善保护管理工作。

我們的工作計劃

我们的调查研究报告和相关的保护管理建议已经提交给海南省林业局和部分自然保护区，以便保护管理者能够了解海南淡水龟类的多样性、分布、栖息地、猎捕、贸易以及保护管理现状，从而考虑进一步的保护管理对策。目前，在国家自然科学基金和香港嘉道理植物园的资助下，我们正在海南开展四眼斑水龟、黄额闭壳龟和锯缘摄龟的生态

discovered in streams in many of the nature reserves (Figs 1, 2, 3), proving the persistence of poaching. This explains the extremely low density of freshwater turtles in nature reserves in spite of relatively intact vegetation²³, confirming that illegal collection and trade pose the biggest threats to Hainan's freshwater turtles.

In addition, habitat destruction is a lethal threat to turtles in certain regions. An example is Nanmaoling in central mountainous Hainan where turtle diversity was high and natural vegetation used to be good. Without the protection of a nature reserve, local villagers are at liberty to cut and burn the secondary vegetation on the hills, converting it for agricultural purposes, and seriously damaging habitat²².

Based on the survey results we propose four conservation recommendations:

- (1) Step up control of illegal collection and trade. Wildlife authorities should strengthen control over markets and restaurants in cities where there is trade or consumption of wildlife products including game meat, and bring violators to justice. Similar efforts should be taken to gear up control over town and rural regions. Investigation should be carried out to track the illegal trade in wildlife products, shut down illegal trade markets and punish the violators. Rewards should be offered to those whose information leads to arrest. A hotline should be set up to facilitate the management of the wildlife-product trade with the supervision of the general public.
- (2) Strengthen the protection of freshwater turtle habitat. While freshwater turtle habitat within nature reserves has generally received adequate protection, habitat outside the existing reserve network faces continued destruction. Forestry bureaus should make more effort to control illegal felling of secondary vegetation and slash-and-burn, and set up new nature reserves where the needs rise.
- (3) Improve the management effectiveness of existing nature reserves. Many nature reserves are important habitats for freshwater turtles, yet the current level of management is simply not sufficient to stop the poaching of turtles. It is suggested that patrolling staff of those nature reserves should intensify their patrolling efforts along rivers and streams so as to spot and demolish trapping gear set by poachers in time. With support from scientific institutions, these nature reserves should conduct turtle surveys and monitor their population by mark-recapture methods. Turtle populations should be selected as an important indicator for performance evaluation and measurement of management effectiveness of the nature reserves.
- (4) Conduct scientific research and trade monitoring. Scientific research is the basis for decisions for proper management and protection measures. It is necessary to continue freshwater turtle surveys and conduct studies on their ecology and conservation biology. Management authorities should work together with scientific institutions to conduct long-term monitoring of the turtle trade, to understand trends and to measure the effectiveness of management and conservation measures. This would enable the steady improvement of turtle conservation by means of adaptive management.

Further work

Our survey report together with recommendations has been passed on to Hainan Forestry Department and concerned nature reserves to help them better understand turtle diversity, distribution, habitats, hunting, trade, and conservation status and to help formulate conservation measures. Funded by the NNSF and KFBG, we are currently conducting field studies on the ecology of *Sacalia quadriocellata*, *Cuora galbinifrons* and *Pyxidea mouhotii*, at the same time providing training for new recruits on turtle study and conservation. We plan to increase our cooperation with Hainan Forestry Department, nature reserves and conservation organisations (such as World Wide Fund for Nature, KFBG, Wildlife Conservation Society and Turtle Conservation Foundation) and will seek financial and technical support in the fields of freshwater turtle survey, studies in ecology and

学研究，培养从事龟类研究和保护的新生力量。我们未来的工作计划是加强同海南省林业局、自然保护区以及野生动物保护组织的合作，积极争取政府和野生动物保护组织(如，WWF、KFBG、WCS、TCF)的资金和技术力量的支援，开展淡水龟类的资源调查、生态学和保护生物学研究、贸易监测和宣传教育工作，协助管理部门进行人员培训、保护管理和执法检查工作的。

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conservation biology, trade monitoring, and education and communication, helping management authorities in their capacity building, protection and law enforcement endeavours.

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裳鳳蝶 *Troides helena* (Linnaeus, 1758)

分佈：分布廣泛，由印度、東至中國華南地區、南至東南亞地區。本園是裳鳳蝶在香港的其中一個主要分布點。

特徵：是中國最大型蝴蝶之一，展翅可達15cm，雌蝶體型較大。前翅以黑色為主，翅脈兩側呈深灰色。雄蝶後翅除翅脈和翅緣呈黑色外，翅室為鮮黃色；雌蝶的後翅翅室內有黑色斑紋。

生態：多出現在熱帶和亞熱帶的中低海拔林區。幼蟲以馬兜鈴屬(*Aristolochia* spp.)的植物為寄主，食量驚人，並有同類互食的現象。蛹受騷擾時會扭動並發出聲響。成蟲喜歡訪花，也常在高空緩慢滑翔。在華南地區，裳鳳蝶一年能繁殖3代以上，並以蛹越冬。

現狀：由於大型和華麗，裳鳳蝶的標本是受歡迎的工藝品，過度採捕也許曾是威脅，因此被列入中國“三有”保護動物名錄和受香港法例第170章《野生動物保護條例》所保護，同時所有裳鳳蝶屬(*Troides* spp.)的物種均被列入《瀕危野生動植物種國際貿易公約》附錄二內。目前蝴蝶農場繁殖的個體應可滿足市場需要，但野外種群仍受林區生境破壞所威脅。裳鳳蝶被中國物種紅色名錄列為近危物種¹。

(羅益奎著)

Common Birdwing

Troides helena (Linnaeus, 1758)

Distribution: Widely distributed from India, to South China in the east and down through Southeast Asia. Within Hong Kong, Kadoorie Farm & Botanic Garden is one of a few strongholds.

Identification: One of the largest butterflies in China, with a wingspan up to 15 cm. Females are generally larger than males and both have black forewings, with grey surrounding the veins. The hindwings comprise brilliant yellow cells with black veins and margins, with additional black cell streaks in females.

Ecology: Found mostly in forest areas of tropical and subtropical regions at low to mid altitudes. The only larval host plants are *Aristolochia* spp.; the larvae have such great appetites they may even eat one another. The pupae when disturbed will wiggle and produce a hissing sound in an attempt to scare away intruders. The adults are attracted to flowers and will glide to great heights. In South China this species usually has more than three generations a year, and is likely to spend winter as a pupa.

Status: Specimens are highly regarded by collectors due to their size and gorgeous appearance. Over-collection was once a major threat to their survival; consequently it is protected in China and under the Wildlife Protection Ordinance (Cap. 170) in Hong Kong and all *Troides* species are included in Appendix II of the “Convention on International Trade in Endangered Species of Wild Fauna and Flora” (CITES). It now seems the market demand can be met by captive breeding, and it is threatened mainly by habitat destruction. It is listed as Near Threatened in China¹.

(By Philip LO)



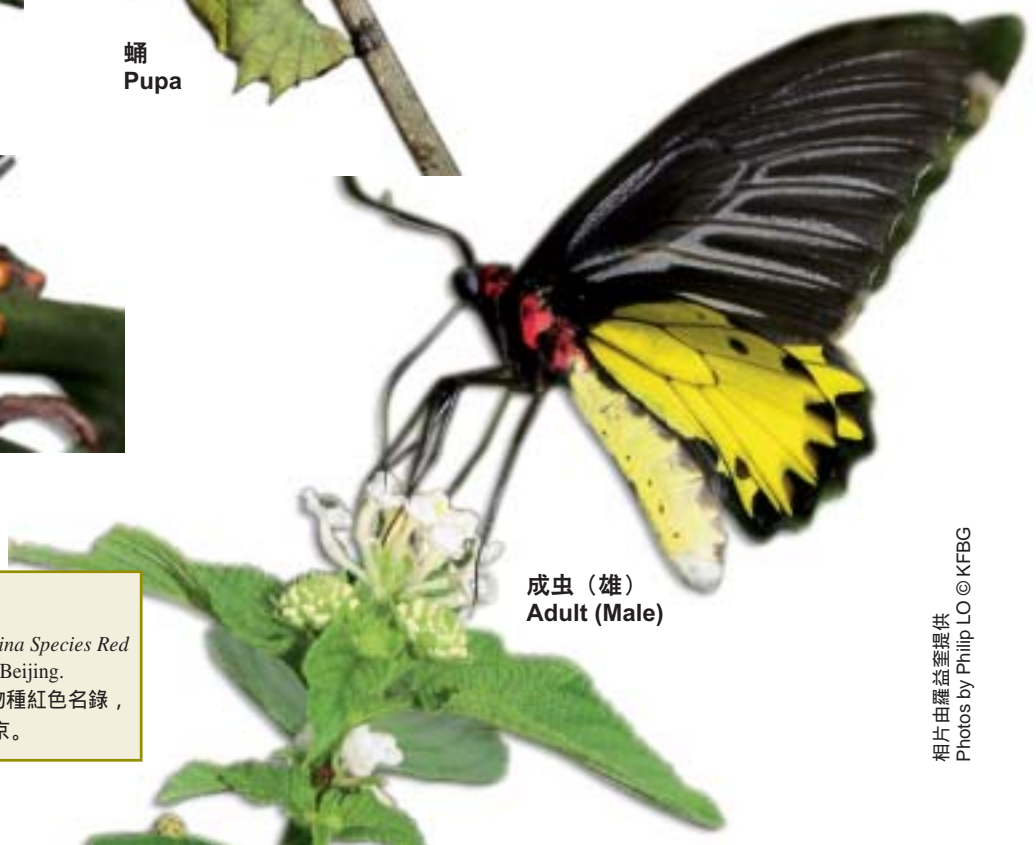
幼虫
Larva



蛹
Pupa



卵
Ova



成虫 (雄)
Adult (Male)

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珍稀物种小档案

Species in the Spotlight

海濱馬兜鈴

Aristolochia thwaitesii Hook f.

海濱馬兜鈴是馬兜鈴屬(*Aristolochia* spp.)植物中少數呈亞灌木狀的物種，其他馬兜鈴屬植物多是木質或草質藤本植物。由於命名者William Hooker誤以為模式標本是培植自采於斯里蘭卡的種子，所以以一位當地的植物採集者W.D.K. Thwaites命名，後來才將模式產地更正為香港¹。低矮的長勢使生長在莖下部的花朵差不多是在地面開放。通常在泥土下面可以找到莖部腫大而形成的塊莖。和其他馬兜鈴屬的植物一樣，花朵的獨特構造能吸引特別的授粉昆蟲。

分佈：非常稀有，只有在廣東省沿岸的香港(大帽山、香港島與大嶼山)與珠海(大萬山島)有分佈。由於受生境破壞威脅，在全球及中國紅色名錄內均被例作易危物種^{2,3}。

生態：馬兜鈴屬植物除了是一些美麗與稀有的蝴蝶物種的重要寄主植物外，它們的花朵與傳粉生物學也非常特別。馬兜鈴屬植物的花朵主要吸引例如蒼蠅等以糞便或屍體等為食物的昆蟲來傳粉，而不是蜂類或蝶類等普遍的傳粉昆蟲。因此馬兜鈴屬植物的花朵通常整體色調也比較低沉，並多具有深紫色。同時，它們的花朵也常具有惡臭味道以吸引這類昆蟲。馬兜鈴屬植物的花朵通常呈長筒形，中間部分呈明顯的收縮或拐彎(例如本種)，內部被有特別的毛以留住到訪的昆蟲。這些毛一般在花粉釋出後枯萎，讓昆蟲離開。

(吳世捷與費樂思著)



圖一：海南馬兜鈴為亞灌木，多不高於40厘米。
Fig 1: *Aristolochia thwaitesii* is a subshrub usually less than 40cm tall.

Seaside Dutchmanspipe

Aristolochia thwaitesii Hook f.

This species of *Aristolochia* differs from most of its relatives (which are mostly vines or lianas) in having a herb-like to shrubby growth form. It was named by William Hooker after a collector in Sri Lanka, W.D.K. Thwaites, under the mistaken belief that the seed of the type specimen came from there – it was later redescribed from Hong Kong¹. It is usually less than 50cm tall, and the flowers are borne near ground-level at the bases of the stems; these often form a swollen, round or ovoid tuber just underground. Like other members of the genus, *A. thwaitesii* has specialised flowers which attract some unusual pollinators (see below).

Distribution and status: A very rare species recorded only from the region of coastal Guangdong, in Hong Kong (Tai Mo Shan, Hong Kong Island and Lantau) and Zhuhai (Dawanshan Island). It is listed as globally and nationally Vulnerable due to habitat decline.^{2,3}

Ecology: Besides being important larval host plants for some rare and beautiful butterflies, *Aristolochia* species are special in their pollination biology. Instead of attracting typical pollinating insects such as bees and butterflies, they specialise in attracting insects in search of a protein-rich diet, especially flies (Diptera) which usually feed on animal faeces and carrion. This is reflected in the colour of the flowers which are usually of a relatively dull tone including dark purple. Most of them also have an unpleasant smell which serves to attract these saprophagous insects. The flower of *Aristolochia* spp. consists of a long corolla tube which usually has a distinct constriction or curvature (as in the case of *A. thwaitesii*) at the middle and specialised hairs inside to trap the visiting insects. When the pollen is released the hairs wither, allowing the insects to leave.

(By NG Sai-chit and John FELLOWES)



圖二：其花多長於莖部末端。
Fig 2: Flower of *A. thwaitesii* are almost always borne near the ground at the lower part of the stem.

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不死的欲望 Surviving Desire

鲱鱼鸥在地上浅浅的窝里下蛋。尽管它们特别呵护自己的后代，但是却不会筑起特别的鸟巢。这些工艺粗糙的家园带来的一个问题是，珍贵的鸟蛋很容易滚出来然后被其它动物吃掉，或是在冷风中被冻死。因此，鲱鱼鸥归来之后的第一件事就是去寻找散落在外面的鸟蛋，并把它们推回巢里。

科学家们不断改变巢外鸟蛋的数目和大小，由此发现了一个简单的行为规划。鲱鱼鸥每次只推一个蛋，且总是按从大到小的顺序。科学家继续用比真蛋稍大一些的仿真蛋做实验。把这些仿真蛋放到鸟巢旁边后，善良的鲱鱼鸥无论真假，仍是往巢里一把劲地推鸟蛋，顺序还是从大到小。

科学家们制造了一些巨大的假蛋。看起来鲱鱼鸥“越大越好”的法则没有什么上限。即使这些人造鸟蛋比成熟的鲱鱼鸥要大得多，它们还是试图先放好最大的蛋。鸟爸爸和鸟妈妈们尽管不可能搬动一个和足球差不多的人造蛋，但是它们还是不屈不挠地努力去推，即便它们真正的孩子就在一边的真蛋中，正因没有被照料好而死去。

为什么进化史上有这种笨鸟，或是说为什么让这样的鸟活下去？其实，鲱鱼鸥的本能与其所在的自然环境非常适应。“越大越好”的法则完美无缺的，因为在真实世界中，鲱鱼鸥永远不会碰到巨大的假蛋，而真蛋越大的意味着会孵出更健康的后代。问题只是出现在那些好管闲事的科学家将这些鸟放到一个特殊环境的时候而已。

和鲱鱼鸥一样，我们的本能也是十分适应我们所生存的自然环境，但问题出在一个工业化的世界。一个重要的例子就是我们好吃的本性。人类始祖总是处于饥饿状态，没有可靠的食物来源，也没有冰箱或者储存设施。他们的生存法于是非常简单；能吃多少就吃多少。当我们在这个富庶的现代世界里再遵循这一法则的时候，大多数人就变得超重和不健康。

那些过时的基因不时地给我们带来麻烦。正如我们的胃口会带来一大堆烦恼一样，我们有许多问题仅仅就是因为对某一件好的东西要求或者索取得太多。一些东西在量少的时候可能有用，但太多的话常常会产生毁灭性的后果。因此，人们的本能需求在新环境中会直接导致问题的产生。在其它的情况下，麻烦的来源会隐蔽一些。让我们来看看昆申人是怎样为了满足自己的生理需求而陷入困境。

前些年，昆申人还在和我们的祖先一样，靠打猎和采集植物为生。20世纪60年代，一些最先接触昆申社会的西方人问他们想要些什么。昆申人的回答很明显：水。他们生活在沙漠之中，一生都在找水而奔波。即使是我们的一个水龙头中慢慢滴落的水滴，对一小群昆申人来说，都是相当珍贵的。

大家可能想不到，在卡拉哈里沙漠蕴藏著大量的地下水。1962年，西方人在一个叫克伊康姆的地方打了5口井，从

Herring gulls lay their eggs on the ground in shallow nests. Though they care dearly for their young, they don't build particularly good nests. The problem with these ramshackle homes is that precious eggs have a tendency to roll out of the nest, where they may be eaten or perish in the cold. Accordingly, the first thing a gull does when returning home is look for stray eggs and push them back into the nest.

Scientists manipulated the number and size of eggs outside the nest and discovered a simple behavioral pattern. The gulls roll the eggs back one at a time and always in the order of biggest to smallest. The scientists continued to tweak this system by making artificial eggs that looked like the natural eggs, but were larger. When they were placed near the nest, the conscientious parents continued to retrieve all the eggs, artificial and natural, from biggest to smallest.

The scientists made enormous fake eggs. The gulls, it seems, have no upper limit to their “bigger is better” rule. Even when the artificial egg was much larger than adult birds themselves, they still tried to save the biggest first. Unable to move an almost football-sized egg, the parent nevertheless tried relentlessly and persisted even as its real babies died nearby in unintended eggs.

Why would evolution design such a stupid bird or allow it to survive? In fact, the gull's instincts function beautifully in its natural environment. “Bigger is better” works flawlessly because in the real world a gull is never going to encounter a gigantic fake egg, and bigger eggs produce healthier offspring. The problem arises only when the birds are placed in an unusual environment run by meddling scientists.

Like the herring gulls, our instincts worked well in our natural environment, but get us in trouble in an industrialized world. A prime example is our love of eating. Ancestral humans were always hungry, having no reliable food source and no refrigerator or storage system. Their survival rule was simple: eat as much as possible. When we follow this rule in our rich, modern world, many of us become overweight and unhealthy.

Our outdated genes frequently get us into trouble. As with our hearty appetites, many of our problems are simply wanting (and getting) too much of a good thing. What is useful in small quantities often becomes destructive in excess, so instinctual desires in a new environment lead us straight to a problem. In other cases, the source of our trouble is less direct. Consider how satisfying the biological needs of the !Kung San got them in trouble.

Until just a few years ago, the San lived as our ancestors did, hunting wild animals and gathering plants. Some of the first Westerners who contacted them in the 1960s asked what they wanted. For the San the answer was obvious: water. They live in a desert and are perpetually searching for water. Even a slow drip from one of our faucets would provide enough for a small band of people.

Lo and behold, there is plenty of underground water in the Kalahari. In 1962 the Westerners drilled five boreholes in the area known as !Koi!kom, thereby providing a stable water supply. Unfortunately, these San simply traded one nightmare for several others. Normally,

而为昆申人提供了一个稳定的水源。不幸的是，这些昆申人不过是用一个噩梦换来了另外几个噩梦。正常情况下，昆申人过著游牧生活，随著动物的迁移或者植物的枯荣而不断搬家。有了水井之后，昆申人就放下了行囊，在附近定居下来。很快，他们就把周围能走得地方的所有动物都给猎杀了，所有的植物也被采光了。

昆申人以前从来不需要什么卫生设施，垃圾和排泄物就扔在帐篷外和篝火边，在生活垃圾没有泛滥成灾之前，他们就离开了。大自然母亲负责进行自然循环。但是，有了水之后，他们就不再愿意搬迁，这时候发现各种垃圾很快堆积如山，并开始招致疾病。“水”梦成真的时候，昆申人不再乾渴，但是饥饿和疾病却接踵而来。

昆申人和鲑鱼鸥的困境揭示了动物本能和自然环境之间复杂的平衡关系。今天，我们每个人都面临著这些问题，它们比以前要复杂得多。对财富、饮食和舒适生活的热爱使我们远离了原先的自然环境，数不清的麻烦由此产生。

我们这个世界的变化速度之快令人目不暇给。一台新计算器刚刚组装好就过时了，一周时间在互联网上俨然就是永恒。与此对应的是，人类的进化缓慢而单调。数千年来，人类的基因也未曾有过多大改变。柏拉图或许不知道什么是电子邮件，但是他享用杯中美酒的乐趣和我们是一样的。在他的头脑里，欢乐的基因按钮和我们现在的一模一样。

实际上，早在柏拉图之前到现在，我们的基因就基本未曾改变。从遗传上讲，我们依然是洞穴中的男女，尽管我们生活在超现代社会里。我们自然的基因世界和现代世界的不对应产生了许多问题。但是，吸毒、肥胖、赌博和破产等问题并不简单地源于这两个世界之间的不协调，这种不协调是无辜的，而真正的答案是险恶的。

商家常常通过利用我们那些过时的基因来获利。例如，人类以及其它灵长类动物爱吃水果是因为水果中有丰富的天然糖分。食品制造商迎合我们爱吃甜食的胃口。一只橙子中只含有10%的糖，而在一些早餐的麦片中，糖分却被加到了50%以上。我们的某一位祖先找到了一个含有天然糖分的橙子肯定会大喜过望，但现在的孩子们却喜欢“嘎吱船长”牌麦片。

与此类似，快餐的推销者们并没有创造出脂肪高、咸味重和热量大的新口味，而是简单地利用了我们已有的内在欲望，他们的食品只不过比我们祖先那时大得多的大餐，我们的味蕾会感到兴奋不已。这种利用人类本能搞创收的产品很多。色情业利用了我们的性要求，肥皂剧满足了我们对社会信息的需求，等等。

“贪婪是好事。贪婪代表了进化精神的本质，并意味著人类不断进步的趋势。”戈登·盖科在《华尔街》说过大体上类似的话，但是他错了。

贪婪不好也不坏，它只是追寻利润。这种动力既使人类研制了各种各样延长寿命的药苗，也同样发明了剥削我们的贷款，这些有害的都有其共同特徵，就是它们都迎合了我们的本能欲望。正是这些欲望使我们频频陷入困境之中。

作者Terry Burnham及Jay Phelan授权转载《Mean Genes》(欲望之源) 结语一节。

they are nomadic, moving from place to place as animal migration or plant seasons dictate. With their boreholes, the San unpacked and settled down nearby. Soon they had depleted all the animals and plants within practical walking distance.

Furthermore, the San had never needed to develop any sanitation methods, leaving their garbage and bodily waste just outside their huts and fireplaces and moving on before debris could build up. Mother Nature took care of recycling. Wedded to their water and unwilling to move, however, they found that their waste piled up and began causing illness. Satisfying the San's water dreams quenched their thirst but made them hungry and sick.

The problems of the !Kung San and the herring gulls illustrate the intricate balance between an animal's instincts and the environment. Today we each face more profound versions of these problems. Our love of possessions, food, and generally easy living has moved us far from our natural setting, creating a plague of troubles in the process.

Our world is changing with dizzying speed. A new computer is outdated by the time it is installed, and a week seems like an eternity in the Internet world. In contrast, evolution is ploddingly slow, and human genes have not changed very much in thousands of years. Plato would have been puzzled by e-mail, but he enjoyed the same buzz we do from a fine glass of wine. His brain contained exactly the same genetic pleasure buttons that we have.

In fact, our genes are largely unchanged from a time long before Plato. Genetically, we are still largely cavewomen and cavemen despite our living in ultramodern homes. This mismatch between our genes' natural world and the modern world causes many problems. Drug addiction, obesity, gambling, and bankruptcy do not, however, stem simply from innocent discord between ancient and modern worlds. The explanation is more sinister.

People profit from exploiting our outdated instincts. Humans and other primates, for example, love fruits because they are naturally loaded with sugar. Food manufacturers pander to our sweet tooth. While an orange is 10% sugar, some breakfast cereals have been pumped up to more than 50%. So one of our ancestors would have let out a whoop of joy to find a naturally-sweet orange, but our children prefer Cap'n Crunch.

Similarly, fast-food pushers did not create our taste for fatty, salty, calorie-laden foods, they simply exploit our existing desire by producing a product with exaggerated features. Our taste buds go crazy for a meal that has more, more, and finally even more of the ingredients that kept our ancestors going. The list of profit-making, instinct-exploiting products is long. Pornography takes advantage of our sexual interests. TV soap operas satisfy our taste for social information. And so on.

“Greed is good. Greed captures the essence of the evolutionary spirit and has marked the upward surge of mankind.” Or so says Gordon Gekko in Wall Street. But he is wrong.

Greed is neither good nor bad, it simply seeks profit. This motive gives rise equally to life-saving vaccines and exploitative loans that charge interest rates north of 100%. What all products – both helpful and destructive – have in common is that they tap into our instinctual desires. It is precisely these desires that so frequently get us into trouble.

Excerpted with kind permission from *Mean Genes*, by Terry Burnham and Jay Phelan. Penguin Books, 2000.



投稿須知

Author Guidelines

《森林脈搏》投稿須知

範疇

《森林脈搏》由嘉道理農場暨植物園中國項目出版，每年兩期，為致力從事華南地區自然保育人士報導環保資訊，提供討論及交流渠道，藉以啟發讀者。《森林脈搏》的內容題材包羅森林和生物多樣性各個保育範疇，尤以改善資源管理與減少威脅為報導主題。凡從事相關保育的工作者、森林管理人員、科研人員及顧問等都歡迎投稿。

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Author Guidelines for Living Forests

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 (about 1,500 words) and short articles (500 words), with photographs, are invited on topics relevant to the magazine's focus in South China.

2. Letters

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

3. Notices and news

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. 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

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 Editor (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 Editor. 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 not be sent to the author unless substantial changes have been made or additional information and clarification is needed.

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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