



嘉道理农场暨植物园（本园）位于香港最高山脉大帽山（957米）北坡下。园内清溪汇流，翠林环抱，还有不少果园和梯田，以及各种保育及教育设施。本园现今是一家独特的公私营合作机构。

1995年1月20日，香港立法局（现为立法会）通过嘉道理农场暨植物园公司条例（第1156章），本园正式成为保育及教育中心。本园虽为公共机构，但经费是来自私营的嘉道理基金。自1995年起，本园致力于推广香港和中国内地的保育及永续生活，并推行各类计划促进动植物保育和有机农业。本园的使命是“大众与环境和谐并存”。

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

KFBG, today, is a unique public-private partnership, incorporated and designated as a conservation and education centre by Ordinance (Chapter 1156) in the Legislative Council of Hong Kong on 20th January, 1995. While KFBG is a public organisation, it is privately funded by the Kadoorie Foundation. Since 1995, KFBG has been focusing on promoting conservation and sustainable living in Hong Kong and Mainland China, with programmes on flora and fauna conservation and the promotion of organic agricultural practices. KFBG's mission statement is “To harmonise our relationship with the environment”.

嘉道理中国保育 Kadoorie Conservation China

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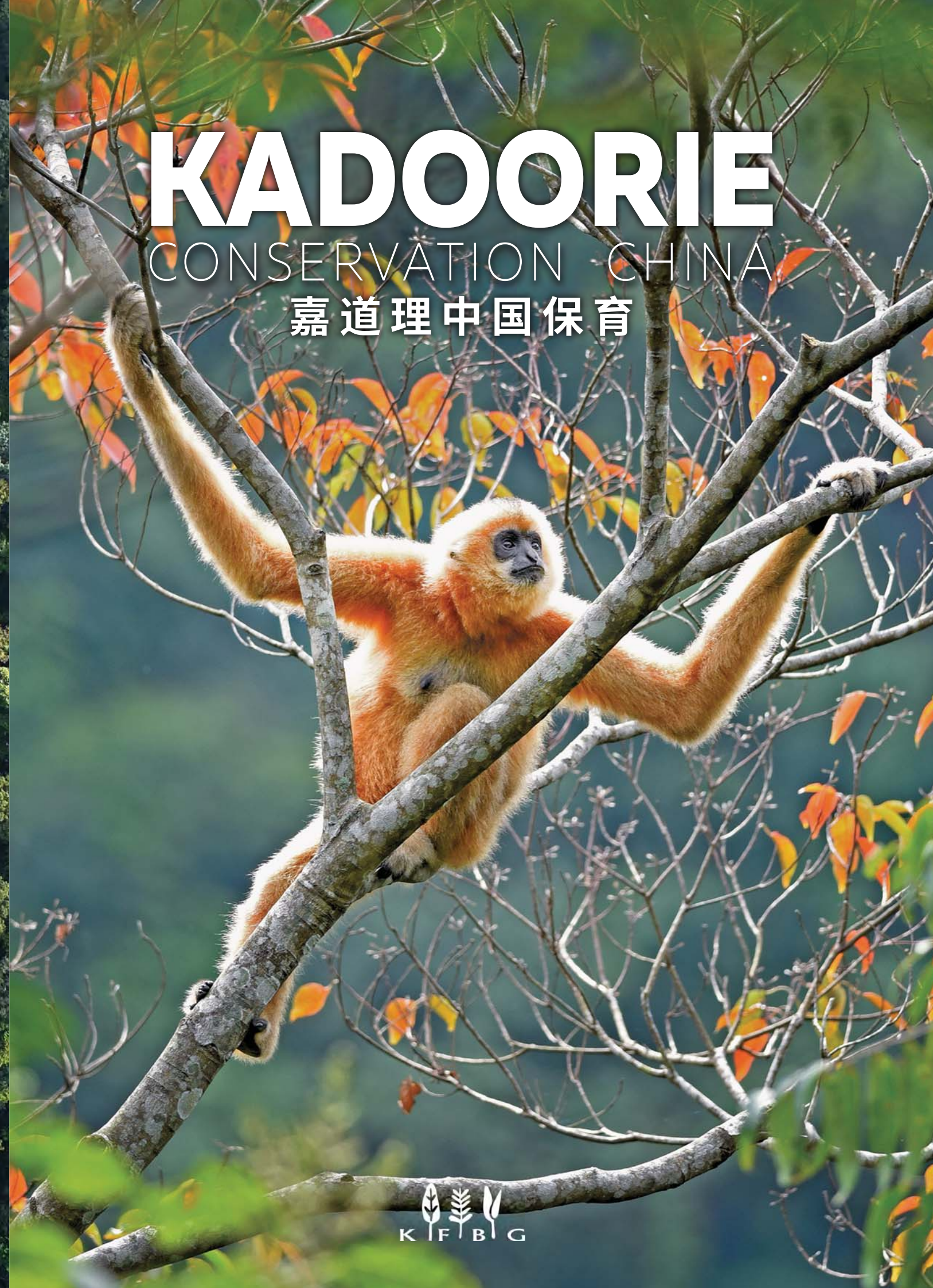
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KADOORIE CONSERVATION CHINA 嘉道理中国保育





我们的历史里程(1998-2018)

Our Timeline from 1998 to 2018

嘉道理中国保育(KCC)为香港环保机构“嘉道理农场暨植物园”的属下部门之一,成立于1998年。我们以减缓中国生物多样性消失和推广可持续理念为宗旨,在国内外开展各类保育项目,包括保护森林生态系统及濒危物种、培育当地人才,提高社区保育意识和推广可持续生活模式。

KCC前身为“华南生物多样性研究队(SCBT)”,主要对华南林区进行快速生物多样性调查,以制定长远保育策略。2011年我们更名为KCC,以更准确反映我们的工作目标和方向。KCC现正开展的项目遍布海南、云南、广东、广西、四川,以及柬埔寨。

Kadoorie Conservation China (KCC) is a department of KFBG – a Hong Kong based environmental NGO. Founded in 1998, we aim to minimise the loss of biodiversity and promote sustainability in China. On-going projects include protection of natural forests, conservation of endangered species, capacity building, awareness-raising and promotion of sustainable living in local communities.

KCC was previously known as the South China Biodiversity Team (SCBT) and focused on rapid biodiversity assessments around South China to formulate our conservation strategy. SCBT was renamed KCC in 2011 to better reflect our focal area and direction. We currently have projects in Hainan, Yunnan, Guangdong, Guangxi, Sichuan of China, and Cambodia.

KCC六大策略方向:
Our Strategic Directions:

物种保护
Species Conservation
生境保护
Habitat Conservation
推广永续理念
Sustainability Promotion
生物多样性评估
Biodiversity Assessment
人才培养
Capacity Building
提高公众意识
Awareness Raising



2000 开展为期三年的广东省野生动物市场调查,为研究野生动物贸易问题提供重要资料。
Launched a 3-year wildlife market survey in Guangdong and published a report which is heavily referenced by wildlife trade researchers.

1998 SCBT正式成立,在接下来的5年内考察了华南超过50个林区。
SCBT formally set up and surveyed over 50 forest sites in South China.

2003 组织海南年度水鸟调查。至今有很多重要发现及保护了不少濒危鸟类的栖息地。
Launched the Hainan annual waterbird survey which continues today; discovered numerous significant findings and protected many critical habitats for threatened species.

2004 在保护区周边村落推广永续生活成为我们的工作方向之一。
Promoting sustainable living in villages around nature reserves became our focal area.

2005 与海南霸王岭保护区合作成立海南长臂猿监测队。
Established the Hainan Gibbon monitoring team with Hainan Bawangling Nature Reserve.

2002 首次在野外使用红外相机,是中国首批使用此技术的团队之一。
First application of camera traps in field survey; one of the first teams to deploy this technique in China.

2003 在霸王岭保护区正式开展海南长臂猿保育项目。
Launched the Hainan Gibbon conservation project in Bawangling Nature Reserve.

2005 组织海南鹦哥岭生物资源大调查,发现大片原始林及丰富生物多样性,引起各界高度关注。
Co-organised a biodiversity expedition at Yinggeling of Hainan, discovered extensive intact forest and high biodiversity which drew much public attention.

2006 主办海南石灰岩生物多样性研讨会以唤醒各方对此独特生态系统的关注。
Organised a workshop on Hainan limestone habitats and their biodiversity to raise awareness of this unique ecosystem.

2006 鹦哥岭保护区管护队伍正式成立, KCC的陈晔乐博士应邀出任特别副站长。
Management of Yinggeling Nature Reserve established, Dr. Bosco Chan of KCC was appointed as a Special Deputy Director.

2009 在广西西大明山开展冠斑犀鸟保育项目。
Launched the Oriental Pied Hornbill conservation project in Xidamingshan, Guangxi.

2008 由2005至2008年间,在霸王岭种植了八万株长臂猿喜食本土树种。
Planted 80,000 native gibbon food trees in Bawangling from 2005 to 2008.

2012 在鹦哥岭道银村举办禁渔区推广研讨会,并重新引进已在当地灭绝的倒刺鲃。
Organised a workshop at Daoyin village in Yinggeling to promote fish sanctuary and reintroduced locally-extirpated Red-faced Giant Barb.

2011 开展“雨林使者”公众科学项目,通过鼓励公众直接参与,为保护海南岛丰富多彩的雨林提供生力军。
Launched the “Rainforest Ambassador” Citizen Science Programme with the aim to encourage public participation and foster support for protection of tropical rainforests in Hainan.

2014 与云南高黎贡山保护区合作,为云南重新发现30年不见踪迹的云猫。
Collaborated with Yunnan Gaoligongshan Nature Reserve and rediscovered the Marbled Cat in Yunnan after 30 years.

2016 与云南高黎贡山保护区合作成立高黎贡长臂猿监测队。
Established the Gaoligong Gibbon monitoring team with Yunnan Gaoligongshan Nature Reserve.

2015 在海南邦溪保护区开展项目以拯救海南坡鹿。
Launched the Hainan Eld's Deer conservation project in Bangxi Nature Reserve, Hainan.

2017 与海南吊罗山保护区合作成立全国首支水獭监测队。
Established the nation's first otter monitoring team with Hainan Diaoluoshan Nature Reserve.

2017 与云南铜壁关保护区合作在盈江利用红外相机拍摄到马来熊在中国的首批影像。
Collaborated with Yunnan Tongbiguan Nature Reserve and obtained the first images of Sun Bear for China in Yingjiang.

2018 在柬埔寨开展了首个海外保育项目。
Launched the first overseas project in Cambodia.

海南长臂猿成年雄猿通体黑色；而母猿呈金黄色，头顶有黑色斑块。海南长臂猿拥有稳定的一雄两雌家庭结构，家庭成员亦较多。Mature male Hainan Gibbon is completely black and female is golden-buff with a black crown. They form stable one male-two females pairing systems and have bigger family groups.



海南霸王岭国家级自然保护区内的原始热带雨林是海南长臂猿最后的家园。The primary rainforest of Bawangling National Nature Reserve is the last home for the Hainan Gibbon.

Hainan Gibbon

Nomascus hainanus

海南长臂猿

海南长臂猿为海南岛特有种；过去无序的栖息地破坏和捕猎使它们数量锐减，目前只残存于海南霸王岭国家级自然保护区一片狭小的原始热带雨林内，是世界上最濒危的灵长类。2003年，KCC受海南省林业厅邀请参与海南长臂猿的保护工作；我们统筹了一次种群数量大调查，并召开首届海南长臂猿保育研讨会，制订长远保护行动计划。调查中只能确认2群13只长臂猿，并识别了它们面对的主要威胁，包括栖息地面积过小及破碎化，关键的低海拔森林严重退化，和强烈的人为干扰等。为恢复海南长臂猿种群，我们联合保护区实施了一系列就地保育措施、开展科学研究和社区宣传教育。

监测和研究

为杜绝破坏行为和深入了解长臂猿的数量变化和生态习性，2005年起，KCC支持保护区成立了海南长臂猿监测队，坚持长期监测猿群。在此基础上，我们从2011年起在距离长臂猿栖息地最近的白沙县青松乡成立了社区监测队，协助保护区进行涵盖所有已知猿群的长期监测。KCC至今共资助了6名科研人员进行有关海南长臂猿的生态、食性、种群动态、潜在栖息地、生境恢复和保育管理的研究，研究成果有助我们完善海南长臂猿的保护行动。

栖息地恢复和保护

为了修复退化和破碎化的长臂猿生境，KCC培训及资助保护区建立苗圃，采集种子抚育长臂猿爱吃的本土树种。我们已在150公顷退化的低地生境种植了51种，共8万多棵长臂猿喜食本土树苗，扩大长臂猿未来的生活空间。KCC一直与村民建立良好关系，减少任何对长臂猿及其生境造成伤害的人为干扰和冲突。如在青松乡推广永续农业以改善村民生计，减少过度依赖森林资源的压力。经过十余年的努力，至2017年长臂猿数量已经增加到4群至少27只。

Hainan Gibbon is only found on the tropical island of Hainan, China. Destruction of rainforest and rampant poaching in the past have put the species on the brink of extinction; it is the most critically endangered primate on earth, currently only confirmed in a small patch of primary forest in Bawangling National Nature Reserve (BNNR). In 2003, KCC was invited by the local authorities to take an active role in saving the Hainan Gibbon, and we launched the first population census survey as well as a conservation workshop. During the survey and workshop, we only confirmed the presence of 13 individuals in 2 groups, and identified the major threats to its survival, namely limited and fragmented habitat, poor quality of the critical lowland forest, and high human disturbance pressures. To save the species from extinction, together with BNNR we implemented a series of in-situ conservation actions, conducted researches and outreach activities.

MONITORING AND RESEARCH

To prevent illegal activities and gain a better understanding of its ecology and population, KCC has been sponsoring BNNR to conduct regular gibbon monitoring since 2005. We established a community monitoring team at the Qingsong neighbourhood in 2011, covering the home ranges of all known gibbon groups. KCC funded six research projects to study the ecology, population dynamics, potential habitat, habitat restoration, and conservation management of Hainan Gibbon; these scientific studies help us to refine our conservation actions for the species.

HABITAT ENHANCEMENT AND PROTECTION

KCC trained and supported BNNR to set up gibbon food tree nurseries in a hope to expand the usable habitat for Hainan Gibbon. Over 80,000 fast-growing gibbon food trees of 51 native species have been planted in 150 hectares of degraded lowland habitat. KCC also built trust with the local communities. We launched sustainable agriculture programmes in the Qingsong neighbourhood, aiming to reduce human pressures on the nearby forests likely to be used by the gibbons. With our determined effort, it is heartening to see the gibbon population increased to four groups of at least 27 individuals in 2017.





海南坡鹿是中国国家一级重点保护野生动物，却备受忽略。雄性坡鹿繁殖期时长有一对独特的弓状鹿角。
Hainan Eld's Deer is a Class I protected species in China but is largely overlooked. The males carry unique and elaborate bow-shaped antlers during mating season.



利用航拍机监测保护区生境质量有助我们更了解保护区的管理需要，以及周边社区的土地利用状况。
We use conservation drone to evaluate habitat quality of the reserve, and the land-use pattern of surrounding communities.



Hainan Eld's Deer

Rucervus eldii

海南坡鹿

坡鹿是一种生活于东南亚低地干旱开阔林的濒危鹿类。由于数量稀少，人们对坡鹿的分类及生态都缺乏深入研究，保护工作难以开展。国际上普遍认为坡鹿共有三个亚种，而海南的种群隶属中南半岛的 *siamensis* 亚种，但中国专家从形态及分子上指出海南种群有其独特性，而且独立演化时间久远。

海南坡鹿曾广布于海南岛沿海低地，但随着人口剧增，土地过度开发，加上一些民众迷信其药用价值而遭大量猎杀，坡鹿种群迅速减少，至1976年只剩下不足50头。为了有效控制打猎等破坏行为，坡鹿最后的栖息地只能用围栏保护，坡鹿数量亦逐渐恢复，现已脱离灭绝的厄运。然而，它们的未来仍然充满挑战：由于保护区面积有限，海南坡鹿的数量早已远超保护区的承载能力，植被长期被过度啃食，生态系统退化，而围栏外合适的土地大多已被开发利用。


自2015年起，KCC与海南邦溪省级自然保护区开展合作，引进了等高储水沟、计划轮牧、混合种植坡鹿喜食本土植物等措施改善生境，并资助修建巡护便道和管理点、为保护区人员提供培训等以提高保护区的整体管护水平。同时也开展社区及学校宣教工作，希望取得周边社区支持。KCC与中国、泰国、老挝和柬埔寨的管理部门及科研单位合作，以最先进的分子生物学手段，分析各地坡鹿种群间的分类地位和遗传多样性，提供更科学的种群管理依据。

Eld's Deer is an Endangered deer species found in open dry forests of lowland Southeast Asia. Due to its rarity, little is known about its taxonomy and ecology, hampering conservation of the dwindling populations. Three subspecies of Eld's Deer are widely recognised, with the Hainan population considered part of the subspecies *siamensis*.

However, Chinese scientists showed that the Hainan Eld's Deer is morphologically and genetically distinct, and has long been isolated from continental populations.

Hainan Eld's Deer occurred across coastal lowlands of the island, but habitat loss and hunting became severe with the influx of mainland immigrants. The deer population undergone a precipitous decline with less than 50 deer remained in 1976. To control illegal activities more effectively, fences were built around the last habitats. The population bounced back and is today safe from imminent extinction risk. However, the long-term future of the Hainan deer is unclear – the deer populations have far exceeded the carrying capacity of the tiny protected areas with signs of ecosystem degradation, and most suitable habitats outside the fenced reserves have been developed.

KCC kicked off a project in Bangxi Provincial Nature Reserve in 2015 to develop a habitat enhancement strategy, in which we constructed water-retention contour ditches, started rotational grazing and conducted mixed planting of native forage plants. We helped improve reserve management by building patrol routes and guard posts, and provide the staff with relevant training. We also launched community work in the surrounding villages and school in order to gain local support. Moreover, KCC collaborates with various authorities and research institutions in China, Thailand, Laos and Cambodia on a conservation genomic study of different populations for the subspecies. Through this cutting-edge research, we are hoping to design more effective protection and population management plans for the species.



高黎贡长臂猿的母猿和婴猿为棕灰色而成年雄猿通体黑色。两条浓浓的白眉是它们重要识别特征。
Adult females and infants of Gaoligong Gibbon are brownish-grey while adult males are black. Both sexes have iconic white eyebrows.

Gaoligong Gibbon

Hoolock tianxing

高黎贡长臂猿

高黎贡长臂猿，又名天行长臂猿，过往被视为东白眉长臂猿（*Hoolock leuconedys*）最东端的种群。2017年，研究人员透过基因和形态学研究把其提升为独立种。高黎贡长臂猿在中国现在仅分布于云南省保山、腾冲以及盈江地区。最新的野外调查显示中国的数量不足200头，其野外生存状况不容乐观，急需加强保护管理。

监测和保护

KCC与云南高黎贡山国家级自然保护区腾冲分局于2016年底开展长臂猿种群数量同步大调查，记录腾冲保护区范围内有7群20只长臂猿。这是目前中国已知高黎贡长臂猿最大的种群，对于该物种的保护至关重要。有见及此，KCC协助保护区建立了长臂猿监测队，以长期保护和监测当地的长臂猿种群，并开展基础生态学研究。KCC也会定期向监测队提供相关的培训和在周边社区举办以长臂猿为主题的宣教活动。

Gaoligong Gibbon, also known as Skywalker Hoolock Gibbon, was previously considered as the easternmost population of the Eastern Hoolock Gibbon (*Hoolock leuconedys*). In 2017, it was described as a distinct species based on its molecular and morphological differences. Currently, the Gaoligong Gibbon is only found in Baoshan, Tengchong and Yingjiang of Yunnan Province in China. The latest survey revealed that there are less than 200 individuals left in China, thus urgent conservation effort is needed.

MONITORING AND CONSERVATION

KCC and the Tengchong Bureau of Gaoligongshan National Nature Reserve conducted a gibbon population survey in 2016 and confirmed 20 individuals in 7 groups, representing the largest known subpopulation in China, and highlights the importance of Tengchong to the survival of the species. In view of this, KCC supported the Reserve to establish a gibbon monitoring team to monitor and protect the remaining gibbons, and conduct basic ecological study to better understand the species. KCC also provides relevant training to the monitoring team and delivers gibbon-themed outreach activities in local communities.





双角犀鸟雄鸟
Male Great Hornbill

中国分布有五种犀鸟，包括双角犀鸟、棕颈犀鸟、花冠皱盔犀鸟、冠斑犀鸟和白喉犀鸟；它们曾广布于桂西南、滇南及西南、和藏东南的热带森林内。
China is home to five hornbill species, namely Great Hornbill (*Buceros bicornis*), Rufous-necked Hornbill (*Aceros nipalensis*), Wreathed Hornbill (*Rhyticeros undulatus*), Oriental Pied Hornbill (*Anthracoeros albirostris*), and Austen's Brown Hornbill (*Anorrhinus austeni*). They used to be widespread across the tropical forests of southwest Guangxi, south & southwest Yunnan and southeast Tibet.

Hornbills of China

中国的犀鸟

犀鸟是大型热带鸟类，巨大的鸟喙能吞食大型果实，加上优秀的飞行能力，是森林中重要的种子传播者，对维持和恢复热带森林十分重要。同时，由于犀鸟只在大型的自然树洞营巢繁殖，它们对生境破坏极为敏感。偷猎及毁林等活动令犀鸟在中国的分布区和数量大为萎缩，现今只残存在少数偏远林区，数量稀少，保护行动刻不容缓。有见及此，KCC与广西西大明山省级自然保护区及云南铜壁关省级自然保护区自2009年起开展各项犀鸟保育工作。

中国犀鸟保育国际研讨会

中国野生犀鸟的保护一直未受到重视，为了引起政府及社会各界的关注及促进交流，KCC分别在2011和2015年召开“中国犀鸟保育国际研讨会”；国内外专家藉此交流犀鸟保育与研究经验，并向内地保护区和相关政府部门提出保育建议。首届研讨会由KCC和广西野生动物保护协会共同举办，共有30多个国内外代表参加；第二届由KCC与云南省盈江县人民政府合办，50多名中外代表在研讨会中共同签署了加强中国犀鸟保护的“盈江宣言”，为保护这些雄隽的热带鸟类订立行动计划。

Hornbills are highly specialised tropical birds and important dispersers of large-fruited trees since they have the biggest gape size amongst all forest birds of the region. They nest almost exclusively in large natural tree cavities, thus are extremely vulnerable to forest destruction. Hunting and forest loss have greatly decimated their populations in China and nowadays only survive in a few remote forest tracts. With the disappearance of hornbills, the future health of tropical forest in China is also jeopardised. KCC has been collaborating with Guangxi Xidamingshan Provincial Nature Reserve and Yunnan Tongbiguan Provincial Nature Reserve to save these majestic birds from extinction since 2009.

INTERNATIONAL WORKSHOPS FOR HORNBILL CONSERVATION IN CHINA

In order to raise awareness for Chinese hornbill conservation amongst government officials and civil society, and facilitate information exchange, KCC organised two workshops on hornbill conservation in 2011 and 2015, respectively. Chinese and international experts shared their experience in hornbill conservation and research, and made conservation recommendations to relevant protected areas and government departments. The first workshop was co-organised with the Wildlife Conservation Association of Guangxi; more than 30 Chinese and international delegates participated. The second workshop was co-organised with the People's Government of Yingjiang County in Yunnan. The “Yingjiang Declaration” calling for enhanced conservation effort for Chinese hornbills was signed by more than 50 Chinese and international delegates, and an action plan was formulated.



广西一只雄性冠斑犀鸟把食物带回树洞喂饲雌鸟及雏鸟。
A male Oriental Pied Hornbill feeding his partner and young enclosed in a tree cavity in Guangxi.



云南盈江是中国唯一有花冠皱盔犀鸟分布的地点。
The Wreathed Hornbill only occurs in Yunnan's Yingjiang in China.

中国水獭的数量及分布范围已经大规模萎缩，只在偏远地区和某些管理较好的保护区或偷猎受控制的大城市周边，依然存活零星种群。

China's otters have suffered a massive decline, only remnant populations are surviving in remote areas, certain well-protected reserves and cities where poaching is effectively controlled.

Otters of China

中国的水獭

中国共分布有三种水獭：欧亚水獭（*Lutra lutra*）、亚洲小爪水獭（*Aonyx cinereus*）以及江獭（*Lutrogale perspicillata*）。由于其皮毛及药用价值，曾被大量捕杀，至上世纪80年代，中国大部分地区的水獭种群已经急剧减少，甚至出现区域性灭绝。虽然自1989年起，三种水獭皆被列为国家Ⅱ级重点保护野生动物，但它们的处境至今仍未被重视，也鲜有任何针对水獭的具体保护行动及研究。相反，在欧美地区的水獭种类早已成为重要的研究和保育对象。

2012年起，KCC开始有系统地调查中国水獭的状况。2016年，我们不仅在云南省盈江拍摄到亚洲小爪水獭在中国的首批生态影像资料，还在人口密集的珠江口发现欧亚水獭的残存种群。2017年初，我们与海南省吊罗山林业局合作成立了中国首支水獭监测队，开始对林区的亚洲小爪水獭进行长期调查与监测。此外，KCC与世界自然保护联盟（IUCN）物种生存委员会水獭专家组及四川唐家河国家级自然保护区在2019年合办第14届《国际水獭研讨会》，希望引起更多人关注中国水獭的保育状况。

Three species of otters are known from China: Eurasian Otter (*Lutra lutra*), Asian Small-clawed Otter (*Aonyx cinereus*) and Smooth-coated Otter (*Lutrogale perspicillata*). They once occurred throughout the country, however, due to excessive hunting for their furs and as traditional medicine, otter populations have dramatically declined, with many local extinctions reported as early as the 1980s. Although all 3 otter species are Class II National Key Protected Species in China since 1989, there has been little conservation attention. On the contrary, their counterparts in western countries have long been popular subjects for research and conservation.

Since 2012, KCC has been systematically studying otters across China. In 2016, we obtained the first photographs of wild Asian Small-clawed Otter for China at a remote stream in Yunnan's Yingjiang, and discovered a population of Eurasian Otter in a busy delta of Guangdong Province. In 2017, we established the nation's first otter monitoring team in Diaoluoshan, Hainan Province with the aim to monitor and protect the dwindling population of Asian Small-clawed Otter. In 2019, we partner with the IUCN Species Survival Commission Otter Specialist Group and Sichuan Tangjiahe National Nature Reserve to convene the 14th International Otter Congress, hoping to raise the awareness of otter conservation in China.

亚洲小爪水獭
Asian Small-clawed Otter



KCC正与海南吊罗山的水獭监测队进行野外考察。
KCC conducting field survey with the otter monitoring team of Diaoluoshan in Hainan.

放置红外相机是调查行踪隐秘的水獭的有效手段。
Camera trap is a useful tool to survey the elusive otters.



Other species we work on...

我们关注的其他物种:





Kratie Province

Cambodia

柬埔寨桔井省

柬埔寨是全球生物多样性热点，是巨鸛（*Thaumatibis gigantea*）、南亚鸛（*Houbaropsis bengalensis*）、白臀野牛（*Bos javanicus*）等众多全球濒危野生动物的重要栖息地。柬埔寨东部的落叶龙脑香林（DDF）更被誉为“亚洲的塞伦盖蒂草原”，是东南亚保存最完好和面积最大的旱生森林；DDF的生态特性极具特色，为很多动物提供居所，亦是保育学家近年关注的特化生态系统。

20世纪70年代，柬埔寨的森林覆盖率曾超过70%，但近年已下降至低于50%。导致森林大规模消失的主因之一，是柬埔寨政府的“经济特许地”政策，允许国内外投资商砍伐天然林以发展大型农场。特许地政策对柬埔寨的生物多样性、环境、农村生计等多方面产生的负面影响在国际上引起了很大的争议。自2017年起，KCC受海南省农业厅邀请，为在柬中资特许地提供以科学为基础的生态保护意见；期望通过科学、创新、合理、永续的发展规划，在柬埔寨东部的桔井省共同打造一个生态友好型的热带生态农业示范区，为柬埔寨特许地探索一种可持续的经营模式。

The Kingdom of Cambodia is a global biodiversity hotspot, home to many globally endangered wildlife, such as Giant Ibis (*Thaumatibis gigantea*), Bengal Florican (*Houbaropsis bengalensis*) and Banteng (*Bos javanicus*). Being depicted as the “Serengeti of Asia”, the deciduous dipterocarp forest (DDF) of eastern Cambodia is the largest intact block of dry forest in Southeast Asia, holding great biodiversity that attracts the focus of much conservation attention in recent years.

In the 1970s, over 70% of Cambodia was covered by natural forest, but this figure has plummeted to less than 50%. The proliferation of Economic Land Concessions (ELCs) is regarded as one of the major drivers of deforestation in recent years. Under the ELC policy, domestic and international investors are granted permissions to clear large tracts of natural forest for agroindustry. This practice has drawn a lot of criticisms due to the impacts on biodiversity, environment and local livelihoods. In 2017, KCC was invited by the Hainan Provincial Department of Agriculture to provide input for biodiversity conservation for Chinese-owned ELCs in Cambodia. We are working with an ELC in Kratie Province of eastern Cambodia to explore innovative, practical and sustainable agriculture development that preserves the biodiversity value of the site, hoping to develop a model for other ELCs.

- 1** 落叶龙脑香林 Deciduous dipterocarp forest
- 2** 黑腿白臀叶猴 Black-shanked Douc (*Pygathrix nigripes*)
- 3** 半常绿季雨林 Semi-evergreen rainforest
- 4** 绿孔雀 Green peafowl (*Pavo muticus*)
- 5** 白腹黑啄木鸟 White-bellied Woodpecker (*Dryocopus javensis*)
- 6** 白臀野牛 Banteng (*Bos javanicus*)





Yinggeling

Hainan Province

海南鹦哥岭

海南中部的鹦哥岭位置偏僻，以往没有进行过深入的科学考察。2003年，KCC团队首次进入鹦哥岭，发现华南最大连片的原始热带森林，古木参天的雨林里蕴含着丰富的生物多样性。2005年，海南省林业厅和KCC联合组织国内外多个科研单位的专家60多人，先后三次深入林区，开展了历时三个多月的综合资源考察，发现大量珍稀物种，包括科学新种如鹦哥岭树蛙（*Rhacophorus yinggelingsensis*）、中国新记录如轮叶三棱栎（*Trigonobalanus verticillata*），和超过160个海南新记录如伯乐树（*Bretschneidera sinensis*）等；充分显示了鹦哥岭无可替代的保育价值。但同时，生态系统亦受到偷猎、滥伐等人为干扰而逐渐退化。有见及此，KCC在海南省林业厅邀请下，自2006年起全

力参与规划及发展鹦哥岭自然保护区，更派遣专家直接参与保护区管理工作，以成为国际水平的保护区为目标。经数年努力，保护区在资源管理、科研监测、社区参与式保育等方面都取得显著成效，并于2014年晋升为国家级自然保护区。这过程中如何解决种种挑战的经验，值得地区内其它保护区借鉴。

Yinggeling (YGL) sits deep in the interior mountains of Hainan Island, and was never properly studied by scientists. KCC conducted a pilot survey of the area in 2003, and was amazed by the extent of primary rainforest and rich biodiversity. In 2005, the Provincial Forestry Department of Hainan and KCC led a three-month expedition to study the area's biodiversity value. The team of over 60 scientists discovered a wealth of exciting biodiversity, including species new-to-science such as the Yinggeling Treefrog (*Rhacophorus yinggelingsensis*), new China records such as the tropical tree *Trigonobalanus verticillata*, and over 160 new Hainan records such as the subtropical tree *Bretschneidera sinensis*. These findings underlined the irreplaceable conservation importance of YGL. However, like many

other forest areas, YGL was slowly being degraded by illegal activities such as poaching and logging. To preserve this unique biodiversity asset, KCC has wholeheartedly supported the Provincial Forestry Department of Hainan to develop YGL into a world-class nature reserve, even assigning a conservation biologist to assist in reserve management since 2006. In a span of few years, YGL has accomplished significant achievements in reserve management, research and monitoring, and community-based conservation, and was upgraded to a national nature reserve in late 2014. The experience gained and challenges tackled in managing YGL prove invaluable as a model for enhanced management of other protected areas in the region.

1 鹦哥岭拥有华南最大连片的原始热带森林。Yinggeling has the largest continuous primary rainforest in South China. **2** 丰富的附生植物以及氤氲的水雾是原始热带雨林的特征。Mature continuous rainforest is always misty and cloaked with epiphytes. **3** KCC在鹦哥岭发现的科学新种——鹦哥岭树蛙。The new-to-science species Yinggeling Treefrog (*Rhacophorus yinggelingsensis*) discovered by KCC.



鹦哥岭是海南两大江河——南渡江及昌化江的重要水源涵养地。自2007年起，KCC联合保护区，向当地社区推广禁渔区的理念，以达到恢复鱼类种群和增加可持续渔获的双赢目标。经多次引导交流，白沙县道银村在2008年订立村规民约，自发把流经村里的南开河最宽最深、鱼类最集中的河段划为禁渔区。我们在2012年于道银村举办“禁渔区推广研讨会”，邀请周边村落参观交流，同时重引入已在当地消失多年的大型鱼类——倒刺鲃（*Spinibarbus denticulatus*）。随着禁渔区在道银获得成功，越来越多村落接受这个崭新的环保理念。现已有10多个村落建立了自己的禁渔区。为了提高年轻一代的保育意识，我们还在附近的学校举办有关鱼类和淡水生态保护的环境教育活动。

KCC和保护区在鹦哥嘴管理分站建立了一个人工湿地来处理污水。人工湿地的第一部分是一个过滤器，过滤出来的物质能用作堆肥。本土观赏植物则用作滤床植物，缔造怡人的景观。经处理的污水流进一个生态池，池里放养一些本土鱼类以控制蚊虫滋生。因原生鱼类对水质敏感，它们的存活是污水处理系统有效运作的最佳指标。设计上也充分利用水向低流的原理，以减少抽水的能源耗用。鹦哥嘴的人工湿地污水处理系统具有很高的实用价值，同时也是向公众传达环境责任观念的重要工具。

KCC和保护区在2010年引进印度的夯土建筑技术，就地取材，利用含5%水泥的夯土建造了一间有传统黎族建筑风格的道银社区中心。夯土墙壁坚硬防水，所消耗的能源仅是一般烧砖的八分之一，大大减低对环境的压力。村民也学会使用受联合国教科文组织认可，印度奥罗维尔夯土建筑学院（Auroville Earth Institute）所设计的欧立压（Auram Press）来建房。

Yinggeling (YGL) is an important watershed for Hainan's two largest river basins – the Nandu River and Changhua River. In 2007, KCC together with YGL started to encourage local communities to consider setting up no-catch zones to restore fish populations and increase catch outside

4 道银禁渔区内成群的野生光倒刺鲃。A school of wild Giant Barb (*Spinibarbus caldwelli*) in the Daoyin Fish Sanctuary. 5 与村民携手重引入已在道银消失多年的大型鱼类倒刺鲃。Reintroducing the locally-extirpated Red-faced Giant Barb (*Spinibarbus denticulatus*) in Daoyin Fish Sanctuary together with the villagers. 6 为保护区周边学校举办鱼类和淡水生态保护的宣教活动。Introducing the local fish species and freshwater ecosystem during a school outreach activity.

those zones. We began the project in Daoyin Village, Baisha County. After lengthy discussions, Daoyin villagers selected the widest and deepest section of Nankai River with the highest fish concentration to be their Fish Sanctuary (FS) in 2008, governed by community rules and regulations. We hosted an FS promotion workshop in Daoyin in 2012 and reintroduced the extirpated Red-faced Giant Barb (*Spinibarbus denticulatus*). The success of Daoyin FS has convinced more villages to accept this novel conservation idea and a dozen or so FSs have been established around the Reserve. In addition, education programmes on fish and freshwater ecosystem conservation were held at nearby schools to raise awareness amongst the younger generations.

KCC and the Reserve designed and built a constructed wetland to treat wastewater at Yinggezui substation. A strainer made up the first stage of treatment and the residue can be used for composting. Ornamental local plants filled the filter bed to absorb the pollutants in the wastewater. The cleaned water is discharged to a polishing pond that is stocked with native fishes to control mosquito larvae. As native stream fishes are sensitive to pollution, their survival is an indicator of the efficiency of the system. The constructed wetland system has high practical value and serves as an effective public education tool to instill environmental responsibility. The local topography was considered in the design to utilise gravity, avoiding the use of electric water pumps and saving energy.

KCC also introduced earth ramming technique from India in 2010 to Daoyin Village and built the Daoyin community centre with village members, using 5% cement stabilised rammed earth. The design preserves the traditional architectural style of the Li minority. The strong, waterproof walls require only 1/8 the energy consumption of fired bricks. The villagers also learned how to make unfired stabilised earth bricks using the Auram Press designed by India's Auroville Earth Institute, that serves as UNESCO Centre for earth building.

©鹦哥岭国家级自然保护区 Yinggeling National Nature Reserve



1 KCC利用环保夯土建筑技术建成的道银社区中心。The Daoyin community centre was built with eco-friendly earth ramming technique introduced by KCC. 2 鹦哥嘴人工湿地污水处理系统的生态池。The wildlife pond of the constructed wetland at Yinggezui. 3 道银村禁渔区。The Fish Sanctuary in Daoyin Village.





©云南高黎贡山国家级自然保护区保山管理局腾冲分局 Yunnan Gaoligongshan National Nature Reserve (Tengchong Bureau)

Gaoligongshan

Yunnan Province

云南高黎贡山

高黎贡山与缅甸山水相连，北接青藏高原，向南申延至中南半岛，亦是伊洛瓦底江和怒江的分水岭，是不折不扣的生物多样性宝地。2014年起，KCC与云南高黎贡山国家级自然保护区保山管理局腾冲分局开展合作，首要目标是对当地的生物多样性进行系统调查，对保护区各级人员进行能力培训和优化宣传教育工作，并针对保护区内的高黎贡长臂猿进行监测及保护（见前文）。为期超过四年的生物多样性调查带来不少惊喜，包括发现了中国兽类新纪录红鬃羚（*Capricornis rubidus*）、为云南在30年后再次记录到的云猫（*Pardofelis marmorata*）、及发现多个科学新种及中国新记录，充分突显了高黎贡山作为“世界物种基因库”的价值。

Gaoligongshan is located in western Yunnan bordering Myanmar, extending from the Tibetan Plateau to Indochina, and is the watershed of the Irrawaddy and the Salween Rivers; as such, Gaoligongshan is considered one of the world’s richest biodiversity hotspots. Since 2014, KCC has been collaborating with the Tengchong Bureau of Gaoligongshan National Nature Reserve (GLGS). We started off with a 4-year field survey to inventory the biodiversity of this majestic forested massif, yielding a number of exciting discoveries, including the first record of Red Serow (*Capricornis rubidus*) for China, rediscovery of the Marbled Cat (*Pardofelis marmorata*) for Yunnan after 30 years, and discovered a number of new-to-science species and new records for China. Capacity building of GLGS staff, enhancement of education & publicity materials and monitoring of the Gaoligong Gibbon are other aspects of our collaboration.



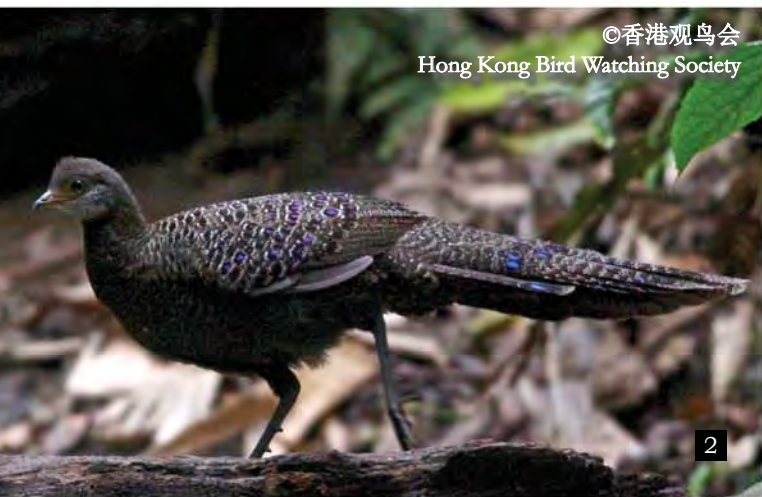
- 1

保护区连绵的森林延申至远处的缅甸。Vast forest of the Reserve extends across the international border to Myanmar at the background.
- 2

云猫 Marbled Cat (*Pardofelis marmorata*)
- 3

腾冲拟髭蟾 *Leptobrachium tengchongense*





Tongbiguan

Yunnan Province

云南铜壁关

铜壁关省级自然保护区位于云南省西南边陲，处于古北界与东洋界的过渡地带，不同成分的动植物在此交汇融合，生物多样性极其丰富。保护区拥有中国面积最大的龙脑香热带雨林，许多热带动植物如孟加拉巨蜥（*Varanus bengalensis*）、鹿角蕨（*Platycerium wallichii*）和花冠皱盔犀鸟（*Rhyticeros undulatus*）等，在中国仅狭域分布于此。铜壁关也是中国唯一已知有花冠皱盔犀鸟、双角犀鸟（*Buceros bicornis*）和大灰啄木鸟（*Mulleripicus pulverulentus*）繁殖的地方。保护区周边世居景颇、阿昌、德昂等少数民族，其生活模式对森林资源的依赖程度较高，对保护区及周边森林构成巨大压力；加上与保护区相邻的缅甸林区近年破坏严重，整个区域的生态系统正在逐渐退化。有鉴于此，KCC与保护区开展合作以更好地保护当地独特的生物多样性。KCC也在保护区周边的那邦镇、铜壁关乡和太平镇积极推动社区参与式保护，通过建立社区保护地、生态旅游和可持续农林项目，凝聚社群力量，共创生态及社区建设双赢局面。

Tongbiguan Provincial Nature Reserve (TBG) sits in the southwestern corner of Yunnan Province, it lies at the crossroad of the Palearctic and Indo-Malayan Realms, supporting a rich and unique biodiversity. The largest patch of dipterocarp rainforest in China is found in TBG, and species such as Bengal Monitor (*Varanus bengalensis*), Staghorn Fern (*Platycerium wallichii*) and Wreathed Hornbill (*Rhyticeros undulatus*) are found nowhere else in China. TBG is also the only site in China where breeding of the Wreathed and Great Hornbills (*Buceros bicornis*) and Great Slaty Woodpecker (*Mulleripicus pulverulentus*) is currently confirmed. The ethnic minority groups of Jingpo, Achang and De'ang have been living in the area for centuries and they rely heavily on forest resources, posing huge pressures to the Reserve and surrounding forest. The once verdant rainforests across the river in Myanmar have experienced severe deforestation, and the ecosystem of the whole region is being degraded. KCC has been actively collaborating with TBG in a hope to better protect its unique biodiversity. In search of a sustainable conservation initiative, KCC has also been promoting community protected areas in the adjacent Nabang, Tongbiguan and Taiping towns by developing land trust, ecotourism and sustainable agroforestry programmes with local communities.



1 鹿角蕨 Staghorn Fern (*Platycerium wallichii*) 2 灰孔雀雉 Grey Peacock-pheasant (*Polyplectron bicalcaratum*) 3 龙脑香热带雨林 Dipterocarp rainforest 4 菲氏叶猴 Phayre's Langur (*Trachypithecus phayrei*) 5 巨松鼠 Black Giant Squirrel (*Ratufa bicolor*)



1

海口羊山湿地拥有很高的保育价值，湿地类型多样，堪称“天然湿地博物馆”。随着海南经济高速发展，海口市拉开了大开发的序幕，引入了多个大型房地产和高尔夫球场等项目。由于人们对羊山的生态及保育价值不了解，一些珍稀物种可能在被我们了解记录之前就灭绝。为此，KCC在2012–2013年组织及培训了一班公众科学志愿者，对羊山湿地进行生物多样性调查。结果显示，羊山地区动植物种类丰富，分布有不少在中国唯海南独有的东南亚热带物种，同时具有独特的景观和文化价值。这结果引起大量媒体报道，让公众和有关部门了解保护羊山湿地的重要性及迫切性，有关部门已落实了保护羊山湿地的一系列措施。

Yangshan Wetland in Haikou, Hainan's capital city, has very diverse wetland types, and has been coined a “natural wetland museum”. With Hainan being developed into an international tourism destination, infrastructure projects for real estates and golf courses have escalated in recent years. However, the biodiversity values of Yangshan Wetland was so little known that sensitive species may disappear before they are discovered and documented. KCC recruited and trained a team of dedicated Haikou volunteers to conduct citizen science biodiversity survey in Yangshan Wetland from 2012 to 2013. The survey recorded high biodiversity including a suite of tropical species found nowhere else in China, highlighting the high ecological, cultural and aesthetic values of Yangshan Wetland. Our survey results received wide media coverage and raised conservation awareness of Yangshan Wetland amongst general public and the authorities, and conservation plans have been formulated to protect this threatened wetland.

2 羊山湿地的珍稀水生植物水菜花。
The rare aquatic plant *Ottelia cordata* in Yangshan Wetland.



26

Protecting threatened habitats

保护受威胁的生境

海南岛缺乏大面积的喀斯特石灰岩景观，但零星散落在岛西部的石灰岩森林却拥有不少特有物种。随着农垦开发和水泥厂对原材料的需求日益增加，石灰岩森林遭受前所未有的严重破坏，但针对这种独特生态系统的保育和研究甚少。为促进这种生态系统的保护，KCC自2004年起积极探索海南石灰岩森林的保育价值；我们资助的科学家发现大片原始热带雨林及众多珍稀物种，包括不少科学新种及中国新记录。我们与海南省林业厅于2006年举办《海南石灰岩生境保护研讨会》，会后将一封由60多个国内外专家签署的联署信送呈海南省政府，呼吁重视海南石灰岩森林的状况，并筹建石灰岩森林保护区。自2009年以来，KCC积极保护海南面积最大、林相最好的俄贤岭石灰岩森林，资助建设保护管理站、培训当地护林员和提供设备、资助科研人员和利用红外相机进行生物资源及违法活动的长期监测，并协助林业部门将俄贤岭申报成为正式的自然保护区。

Hainan Island has limited area of limestone karst landscape, but these limestone gems, scattered mainly in west Hainan, support many species found nowhere else on earth. Sadly, the ever-expanding demand for agroindustry and cement factories are putting unprecedented pressures on these limestone forests, and very little have been done in studying and preserving this unique ecosystem. Since 2004, KCC has been working with partners to study Hainan's limestone forest and its conservation values; researchers we supported found pristine rainforest, many new-to-science species and new China records. To conserve the limestone ecosystem of Hainan, KCC and the Provincial Forestry Department co-organised the workshop “Hainan Limestone Habitats and their Biodiversity” in 2006; declaration signed by over 60 ecologists from China and abroad was sent to the Provincial Government, highlighting the conservation needs of limestone

habitats in Hainan, and calling for the establishment of limestone forest nature reserves. KCC has been heavily involved in protecting the Exianling limestone forest, which is the largest limestone outcrop in Hainan with the best-preserved forest. Since 2009, we have sponsored the construction of a ranger station, provided training and equipment to local wardens, and monitored its biodiversity and threats by camera trapping and field research. We work with the Provincial Forestry Department in efforts to gazette Exianling as a formal nature reserve.

1 海南保存最完好、面积最大的石灰岩森林——俄贤岭。
Exianling – the largest and best-preserved limestone forest in Hainan.



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1 海南青松乡苗村后方呈浅绿色的是橡胶人工林，与海南长臂猿栖息地毗邻。橡胶纯林占海南岛16%土地，对当地生态构成重大威胁。仿自然橡胶混农林系统模仿天然林多层次结构种植，可减少对环境的负面影响。Rubber plantations (light green-shaded vegetation) behind the Miao village of Hainan's Qingsong Township are adjacent to the Hainan Gibbon habitat. Monoculture rubber occupies 16% of Hainan's land area, posing a major threat to the island's ecosystems. Diversifying plantations using analogue agroforestry that mimics the multi-layer structure of natural forest reduces the negative impact. **2** 底层作物益智及海南柃叶间种在仿自然橡胶混农林系统里，可为村民提高收入同时，丰富人工林的生物多样性。Understorey crops cardamom and dumpling leaves intercropping with rubber in the analogue agroforestry can diversify income sources to farmers and biodiversity of the agro-ecosystem. **3** KCC林下套种益智项目的受惠农户。The beneficiaries of our rubber analogue agroforestry programme.

Making agro-ecosystems sustainable

永续农业生态系统

仿自然橡胶混农林系统

橡胶是中国重要的经济作物，海南和云南西双版纳是其主要产区。在海南，橡胶种植是海南史上最成功的扶贫项目，大量天然林被单一种植的橡胶林取代，成为农户的主要收入来源。胶农大量喷洒除草剂清除林下植被，污染水源和减少生物多样性；林下缺乏植被覆盖导致土壤有机质含量和保水能力下降，进一步减低橡胶林的生态系统服务功能，对保护区的生态也构成重大威胁。

模仿多层次天然林的农林混作系统能提高土地利用效率，是遏制橡胶林持续扩张和提高生态系统服务功能的有效途径。自2010年起，KCC联同海南的合作保护区一起推广在橡胶林下套种耐阴的本土经济作物，包括益智（*Alpinia oxyphylla*）和海南柃叶（*Phrynium hainanense*）等。此外，我们也鼓励当地村民加入降香黄檀（*Dalbergia odorifera*）及土沉香（*Aquilaria sinensis*）等本土树种，增加村民经济收益、农作物多样性以及农地效益。林下作物也能防止水土流失和增加土壤有机质，并降低村民使用除草剂的需要，增加人工林内的生物多样性。

RUBBER ANALOGUE AGROFORESTRY SYSTEM

Rubber is considered a strategic crop in China with Hainan and Xishuangbanna of Yunnan Province being its largest local production bases. Almost every rural household in Hainan depends on rubber as the major income source and it is the most successful poverty alleviation programme locally. Extensive natural forests were cleared to establish mono-crop rubber plantations, herbicides are heavily used to clear vegetation, polluting the water sources and reducing biodiversity. The lack of ground cover also reduced soil organic matter and its water retention capacity, further reducing the ecosystem services provided by rubber plantations; this ongoing practice poses a major threat to the ecosystem health of protected areas.

One approach is to intensify rubber plantations with agro-forestry system that mimic the multi-storey structure of natural forest. This improves the ecosystem services and increase income that curtails the further expansion of rubber plantations. Together with our partner nature reserves in Hainan, we promote the planting of shade-tolerant and economically viable native herbs such as bitter cardamom (*Alpinia oxyphylla*) and dumpling leaf (*Phrynium hainanense*) as understorey crops in existing rubber fields. We also integrate the planting of high-value native trees particularly rosewood (*Dalbergia odorifera*) and agarwood (*Aquilaria sinensis*). In addition to income improvement, the introduction of rubber agroforestry increases crop diversity and land use efficiency, prevents soil erosion, accumulates carbon that improves soil fertility and soil moisture retention, deters the use of herbicides and improves biodiversity.

保育海南本地蜜蜂和无刺蜂

滥用农药导致蜜蜂数量急剧下降，果园现需依赖昂贵的人工授粉，近年引起全球关注。海南岛拥有独有种东方蜜蜂海南亚种（*Apis cerana hainanensis*）及两种无刺蜂——黑胸无刺蜂（*Trigona pagdeni*）和黄纹无刺蜂（*T. ventralis*）。与一般商业蜂场引进的外地东方蜜蜂和西方蜜蜂（*Apis mellifera*）相比，海南蜜蜂的蜂群较小，产蜜量较低，采蜜范围也远比西方蜜蜂小且逃蜂的倾向较高，但却是南药益智（*Alpinia oxyphylla*）等众多本地植物的主要传粉者，对本地生态系统十分重要。

要说农民改养较低产的本地蜂甚具挑战性，但我们仍积极在保护区周边社区推广生态养蜂，希望村民能从养殖本地蜜蜂中获实际受益，从而保存村边的天然林。我们根据蜜蜂的习性设计了“多层式”和“直立式”蜂箱，给蜂农进行培训，协助他们达到有机蜂蜜的生产标准。此外，我们推广少人关注却在热带地区有重要传粉功能的无刺蜂，专门设计了“两段式”蜂箱，让蜂群在收蜜时不受干扰。无刺蜜的蜂蜜有其独特风味，比一般蜂蜜有更高市场价值。我们也与蜂农一起研发蜂蜜酒，为蜂蜜产品增值。把养蜂结合到橡胶混农林系统里，更可为益智传粉，提高产量，达至多赢局面。

CONSERVING THE HAINAN NATIVE BEE AND STINGLESS BEES

The indiscriminate use of pesticides have caused marked global decline of bee populations in recent years, and fruit plantations now resort to the more expensive artificial pollination. Hainan has an endemic subspecies of honeybee (*Apis cerana hainanensis*), and two species of stingless bee (*Trigona pagdeni* and *T. ventralis*). The Hainan honeybee forms small colonies with low honey production compared to other “commercial” bees like the Chinese bee from the mainland and the exotic Western honeybee (*Apis mellifera*). The foraging range of Hainan honeybee is far shorter than that of western honeybee, and has a very high tendency to abscond. Despite these shortfalls, Hainan honeybee is

the major pollinator of many native plants, including valuable herbs like the cardamom (*Alpinia oxyphylla*), therefore is important to the local ecosystem.

Although it was quite a challenge to convince beekeepers to go for the more delicate and less productive local bee, we promoted the idea to farmers around nature reserves in an attempt to provide incentives for villagers to preserve their community forests. We designed the “pagoda type” and “vertical type” beehives to suit the natural behaviours of bee, and train beekeepers to meet organic honey production standards. Besides, we promote keeping the little-known stingless bees of Hainan, which are largely neglected although they are major pollinators in the tropics. We designed a “2-chambers bee box” so that the brood is not disturbed during harvest. The unique tasting stingless bee honey is much more expensive than the usual honey and we are exploring production of honey wine as a value-added product. We also encourage beekeepers to put their beehives under the rubber agroforestry system as these insects pollinate the cardamom and improve yield.

稻鸭共育

为减少种植水稻所需的农药，KCC在海南和广西引进了稻鸭共育技术来协助除虫和除草。鸭子的排泄物为水稻提供养分，游泳时翻动淤泥又能提高土壤含氧量，有助促进水稻生长。引入鸭子不但能节省人力，在水稻收割之时它们也能成为桌上佳肴。

INTEGRATING DUCKS IN RICE FARMING

To minimise the use of harmful chemicals in rice paddy, KCC introduced the rice-duck farming technique in Hainan and Guangxi to control pests and weeds. Duck’s droppings fertilise the rice and their swimming actions aerate the soil for better rice growth. More importantly, it saves labour and the ducks can be consumed in time with the rice harvest festival.

永续农业推广

自2010年起，KCC与多位合作伙伴不断探索，以促进永续农业在中国的研究和发展。课题包括“稻田和气候变化”以减少稻田所排放的温室气体。我们分别对稻鸭共育、稻鸭施硅、稻鱼共育、旱稻以及水稻覆膜等农业技术与温室气体减排效应进行研究，并向农户推广成功的技术。其中一项创新技术是水稻覆膜系统，即以覆盖胶膜保持土壤温度和水分，增加微生物活性，有利农作物生长。水稻覆膜技术令有机水稻的产量从每公顷5.2吨大幅提升到10.8吨，减少66%的肥料投入及11%的温室气体排放，又能省水省人力。这技术的应用面积已超过400,000公顷。2012年，我们与四川省农业科学院共同开展以“覆盖免耕和农林混作”为主题的研究，发现覆盖免耕系统可以减少农业成本和劳动力的投入，同时还能增加产量和土壤的有机质含量。

2015年，我们开始推广轮牧系统以作为退化草场的永续土地管理方法。在海南一个退化的坡鹿栖息地中，我们尝试利用分区轮剪方法，鼓励坡鹿随嫩草的生长移动，模仿非洲大草原中草食动物的移动方式。试验结果显示，剪草比烧地和犁地更有效地提供坡鹿喜食的食物，也符合生态效益。

SUSTAINABLE AGRICULTURE PROMOTION

KCC has been collaborating with various partners to research and promote the multiplication and advancement of sustainable agriculture in China. We started in 2010 with a study on “Rice and Climate Change” that focused on reducing greenhouse gases in paddy fields. We looked into the methane emission of rice-duck, silicon-rice-duck, rice-fish, aerobic rice, and rice-plastic mulch technology, and promoted the successful models to the wider farming community. One of those innovative and encouraging techniques is the rice-plastic system, in which a layer of plastic mulch could keep the soil warmer, retain moisture and make the soil more biologically active, speeding up crop growth. Rice mulch dramatically increases organic rice yield from 5.2 t/ha to 10.8 t/ha, reduces fertiliser use by 66% and greenhouse gas emission by 11%, as well as reducing irrigation water and labour. The adoption rate had now reached

more than 400,000 hectares. The succeeding research topic was “Mulch-No Till and Agroforestry” in 2012 in collaboration with the Sichuan Academy of Agricultural Sciences, and proved mulch-no till system could reduce farm inputs, labour, increase productivity and retain more carbon in the soil.

In 2015, we started to promote rotational grazing as a sustainable management system for the recovery of degraded rangeland. In a degraded habitat of Hainan Eld’s Deer (*Rucervus eldi*), we piloted rotational mowing of the grassland to encourage movement of the deer looking for young grass shoots, mimicking the natural movement of herding ungulates in African savannahs. We found out that mowing is more eco-friendly than burning and ploughing.



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2

Biodiversity assessments

生物多样性调查

华南地区面积辽阔，长期受严重人为干扰，保存较完好的森林都隐藏于偏远山区深处。要评估区域内的保育重点和动植物的最新分布和状况，由一队固定的生物多样性专家对不同林区进行快速调查是一项比较简单高效的方法。自1998年起，KCC与伙伴机构合作，在华南地区超过60个林区进行调查，至今共出版了40个调查报告和一系列相关的科学文章，发现和描述了不少中国昆虫、鱼类、两栖爬行类、鸟类和兽类科学新种及新记录，为研究和保护华南的生态状况提供最新资料。华南森林生物多样性调查报告系列可于嘉道理农场网页下载。

海南年度越冬水鸟调查

海南岛是东亚——澳大利亚候鸟迁飞路线上的重要一站，岛上大面积多样化的湿地生境为各种水鸟提供理想的栖息地，可惜大部份湿地并未受保护，其保育价值也未被认识。自2003年起，KCC连同海南省林业厅及其他伙伴，每年冬季在全岛超过70个湿地进行水鸟调查，发现了大批新记录，和确认一些全球濒危物种包括黑脸琵鹭（*Platalea minor*）新的越冬地。这些湿地的重要保育价值也因此被有关部门认识，并因而建立新的湿地保护区。调查同时为海南培养了一批鸟类调查人员，他们当中有不少已经成为保护区和NGO的骨干成员。



3

The extensive South China region has experienced sustained and severe human impacts. The remaining good-quality forests are scattered in remote mountainous areas. Rapid survey by a fixed team of biodiversity specialists is an efficient method to prioritise conservation interventions and understand the current status and distribution of the region's flora and fauna. Since 1998, KCC and partners have been carrying out rapid biodiversity assessments in over 60 forest areas throughout South China. We have published 40 field reports and a series of scientific publications, including the discovery of many insects, fishes, amphibians, reptiles, birds and mammals which are new-to-science or new to the provinces, updating the conservation values and threats of South China. South China forest biodiversity report series can be downloaded from the KFBG website.

HAINAN ANNUAL WINTERING WATERBIRD SURVEY

Hainan is an important stopover along the East Asian-Australian Flyway for migratory birds. Its diverse and extensive wetland ecosystems provide suitable wintering ground for different waterbirds. Many of these sites are unprotected and their conservation values are not fully recognised. Since 2003, KCC partnered with the Hainan Provincial Forestry Department and other collaborators to conduct annual wintering waterbird survey in over 70 sites throughout the island. These surveys yielded many new island records and discovered new wintering sites for globally threatened species, such as those of the Black-faced Spoonbill (*Platalea minor*). The conservation values of these sites have since been recognised and some have been designated as nature reserves. The surveys also trained up local birders, some of whom are now core members of nature reserves and NGOs.



5

1 KCC团队深入云南林区放置红外相机。The KCC team crossing a rapid to install camera traps in Yunnan. 2 鱼类调查中水下拍摄的海南异鳊。An underwater photo of *Parazacco fasciatus* taken during a fish survey. 3 鸟类对环境变迁极为敏感，调查所积累的数据可以见证海南在这个剧变时代的环境变化。Birds are very sensitive to environmental changes which make them a good indicator of ecosystem health of Hainan. 4 KCC带领护林员在高黎贡山进行生物多样性调查。KCC leading the wardens to conduct biodiversity survey in Gaoligongshan. 5 夜间考察是KCC野外调查的常规活动。Night survey is part of the routine fieldwork for KCC.

KCC团队发表的科学新种

Number of New-to-science
Taxa Described by KCC

48+

Opsitrotropis laui

Leptolalax tengchongensis

Talcaea tyensani

Cnidopus yingchongensis

Terniopsis daoyinensis

Gekko kwangsiensis

Brachytarsophrys popoi

Porphyrio porphyrio

Emberiza pusilla

Siphobolus atropurpureus

Tinidibys albonotus

Chrysoglyphus vittatus phoipan

Opisthotropis maculosa

Capreolus rubidus

KCC团队发现的 国家/区域新纪录

100+

Number of National/Regional New
Records Discovered by KCC



- 1 云豹 Clouded Leopard (*Neofelis nebulosa*)
- 2 贡山麂 Gongshan Muntjac (*Muntiacus gongshanensis*)
- 3 培训护林员使用红外相机。Teaching wardens how to set up camera traps.
- 4 红腹角雉 Temminck's Tragopan (*Tragopan temminckii*)

红外相机调查

我们利用透过动物体温触发自动拍摄的红外相机来调查和监测野生动物。自2002年起，KCC在海南、云南、广西、广东、江西和安徽等多个省份采用此技术，是中国首批使用此野外调查技术的团队之一。十几年来，我们的调查数据不仅为多个保护地提供了重要的本底资料和保护依据，同时也获得了一系列中国珍稀濒危动物（如马来熊、水獭、云豹和贡山麂等）的影像资料，并为这些动物的最新分布及状况提供了重要信息。

CAMERA TRAP SURVEY

We have been using camera traps to monitor wildlife in our surveys since 2002, and is one of the first teams to deploy this technique in China. We have been deploying camera trapping technology in Hainan, Yunnan, Guangxi, Guangdong, Jiangxi and Anhui provinces, which obtained invaluable information for the planning and conservation work in many nature reserves, and also collected rare images of some highly threatened species, such as Sun Bear, Clouded Leopard, otters and Gongshan Muntjac, providing us with solid evidence to update the status and distribution of many species.



Capacity building 人才培育

协助保护区提升管理素质是KCC的工作重点之一。除了直接参与海南鹦哥岭国家级自然保护区的管理工作外，我们也为不同保护区在功能区规划、资源管理、科研监测和社区工作各个范畴提出针对性建议，并引入合适的先进保育理念，同时也安排保护区管理人员到国内外保护区及研讨会学习交流。为提升伙伴保护区的士气及归属感，我们为他们设计保护区标志，用于宣教材料及团队制服上。

KCC定期为保护区前线护林队伍提供各种培训，内容包括巡护和考察技巧、物种鉴定与调查，以及野外工具使用等。我们让护林员参与野外调查和物种监测，表现优秀者更会接受进一步培训，强化野外作业和物种鉴定的技巧，增值成为本土专家，参与科研工作。不少护林员来自当地村落，世代靠森林资源为生。我们长期参与前线工作，耳濡目染下对他们灌输保育概念，将昔日破坏者转化为森林卫士，并把这种风气带回社区。

自2013年起，KCC会选出一个广泛被忽略的重要保育议题，并召开保育论坛，广邀国内外专家及保护区管理人员出席交流，推动中国保育力量与国际接轨。论坛主题包括“红外相机野生动物监测”、“中国生态保护本土机构发展”、“中国热带及邻近地区兽类分类与保育”、“中国犀鸟保育”、“全球坡鹿保育”等。KCC也经常在国际保育研讨会上分享中国及邻近地区的保育状况，让各国人士更了解中国在生物多样性保育方面取得的成就及面临的挑战。我们也积极与各地专家和保育机构交流最

新信息和寻找合作机会，多位成员获邀担任世界自然保护联盟（IUCN）辖下物种生存委员会不同专家组的成员，更多次参与IUCN红色名录物种评估工作。

KCC被关键生态系统合作基金（CEPF）选为中缅生物多样性热点（简称中缅热点）的中国区域执行团队，负责管理所有在中国的资助项目，包括香港、澳门、海南岛和广东、广西及云南的南部地区。CEPF由法国国际发展署、保护国际基金会、欧洲联盟、全球环境基金、日本政府、麦克阿瑟基金会以及世界银行联合发起，主要目的是推动民间组织参与生物多样性保育。2013–2020年，CEPF在中缅热点开展第二期项目，期间投资总计六千万元人民币，用于资助包括中国南部、缅甸、老挝、越南、柬埔寨和泰国六国的生物多样性保护项目。如欲了解更多，请前往嘉道理农场网页www.kfbg.org/chi/CEPF-main.aspx或以电邮方式与我们联络：cepf@kfbg.org。此外，KCC的专家也被邀请担任阿拉善SEE基金会“劲草同行”项目的公益导师及澳大利亚保护区管理组织PALRC的督导委员会成员，协助促进本土NGO以及亚太地区保护地的能力建设。

Enhancing nature reserves’ management capacity is one of KCC’s priorities. In addition to direct involvement in managing Hainan Yinggeling National Nature Reserve, we advise different reserves in the aspects of reserve planning, resource management, research and monitoring, and community-based conservation. We recommend specific conservation interventions, as well as introducing appropriate advanced conservation approaches to reserve management. We also organise local and overseas study tours for our partners. To boost the morale of our partners, we designed a number of reserve logos which are proudly embedded in their education materials and team uniforms.

KCC also provides regular training programmes for frontline wardens; topics cover patrol and survey techniques, species identification and inventory, and use of field equipment. We involve wardens in field surveys and monitoring, and advanced training will be given to outstanding performers. Some of them are becoming local experts or “parataxonomists” and contributing to actual research work. Most wardens are local villagers with long tradition of forest resource use; we instil conservation concepts through working with them on a day-to-day basis, slowly transforming former hunters/loggers into forest guardians, who help spread conservation messages back in their communities.

Since 2013, KCC identifies major conservation issues which has been largely neglected and organises conservation forums, topics include “Camera trap in wildlife monitoring”, “Development of China’s grass-root conservation NGOs”, “Conservation strategy of overlooked mammals in tropical China”, “Conservation of hornbills in China” and “Range-wide conservation of Eld’s deer”, etc. The forum serves as a major platform for sharing and exchange amongst reserve managers and experts, in a hope to raise the capacity of China’s conservation practitioners to international standard. KCC also regularly shares information on conservation issues of China and surrounding areas in international conservation conferences so that the international community is kept abreast of the development in China. KCC maintains regular communications with the international conservation community

to exchange latest conservation news and seek opportunities for collaboration. Many of us are members of various IUCN Species Survival Commission Specialist Groups and contribute to many species assessments for the IUCN Red List.

KCC is the Regional Implementer for China’s Critical Ecosystem Partnership Fund (CEPF), responsible for managing all projects in South China includes Hong Kong, Macau, Hainan Island, southern parts of Yunnan, Guangxi and Guangdong. CEPF is a joint initiative of l’ Agence Française de Développement, Conservation International, the European Union, the Global Environment Facility, the Government of Japan, the John D. and Catherine T. MacArthur Foundation, and the World Bank. A fundamental goal is to ensure that civil society is engaged in biodiversity conservation. In the years 2013–2020, CEPF implemented the second phase investment within the Indo-Burma Biodiversity Hotspot, investing US\$10 millions in biodiversity conservation projects in South China, Myanmar, Laos, Vietnam, Cambodia and Thailand (More information is available on KFBG website: www.kfbg.org/eng/CEPF-main.aspx. For enquiries, please contact us: cepf@kfbg.org). Specialist from KCC is also invited to be the Advisor for the Chinese conservation NGO called “Society of Entrepreneurs & Ecology” to enhance the capacity of NGOs in China, and the steering group member of the Australia-based Protected Areas Learning & Research Collaboration (PALRC).





Awareness raising

提高公众意识

让艺术融入环保教育

近年兴起将艺术融入环境教育，以另一角度引领大众欣赏自然。2015年起，KCC在项目点周边尝试以壁画形式宣扬保育讯息，毗邻海南长臂猿栖息地的白沙县青松乡、海南邦溪省级自然保护区和海南省乐东县一个有圆鼻巨蜥出没的村落是我们进行环保壁画创作的试点。我们与大学艺术系志愿者和村民在墙上描绘海南热带雨林的风光及特别的动植物，鼓励村民珍视与他们为邻的鸟兽虫鱼。壁画除了有温馨提示作用，也为村落带来色彩与话题，村民及保护区都十分受落。此外，我们也举办不同的艺术创作比赛，例如犀鸟绘画比赛和国际水獭研讨会标志设计比赛，希望唤起当地居民及大众对生态保护的关注。

BRINGING ART INTO ENVIRONMENTAL EDUCATION

Encouraging the general public to appreciate nature through art is becoming a popular form of environmental education in recent years. Since 2015, KCC has started using murals as a soft approach to promote conservation messages. We selected several sites for our maiden mural works – villages in Qingsong Township that are privileged to live close to the Hainan Gibbons, Hainan’s Bangxi Provincial Nature Reserve, and the villages in Hainan’s Ledong County which are home of the Water Monitor Lizard. Together with art undergraduate volunteers, appealing paintings of Hainan’s tropical forests and impressive wildlife were painted on walls. Villagers were keen to participate in the murals through which we hope they would value the beauty of forests and biodiversity they live with. The murals might fade later, but hopefully the seeds of protecting nature could bear fruits. In order to raise public awareness on wildlife conservation, we also organise various design and drawing contests such as hornbill drawing competition and logo design competition for the International Otter Congress.

出版物及宣传品

KCC会把项目点内发现的重要及珍稀动植物以文字及影像详细记录，通过社交媒体及出版各类书籍、报告及科学文章，让同行、保护区工作人员及自然爱好者更加了解中国的生物多样性及自然保育的现状、进展和需要。筹备多年的海南自然图鉴系列《乐赏大自然》涵盖了海南主要的动物类群，各图鉴由长期在海南进行研究的专家学者编著，附以大量在野外实地拍摄的活体彩照，是关注该地区生物多样性人士的必备读物。同类的出版物还有以我们历时三年考察成果为基础的《腾冲高黎贡山的动植物》。我们也编制不少面向公众及小朋友的科普出版物及宣传品，例如《森林乐猴》和《丘陵传说》，把海南长臂猿和海南坡鹿的保育历史以简单有趣的卡通故事形式展示。其他宣教材料包括宣传单张、海报、告示板、春联、挂历、贴纸、T恤、环保布袋以及您正在阅读的资料册。若对KCC的出版物感兴趣，请联系我们：kcc@kfbg.org。

PUBLICATIONS AND PUBLICITY MATERIALS

KCC makes detailed written and audio-visual records of significant findings from our project sites, and shares these information with nature reserve staff, fellow conservation practitioners and nature lovers via social media, publication of books, reports and scientific papers. Our Hainan Wildlife Field Guide Series has taken years of preparation by specialists working in Hainan; it provides update information on major wildlife groups with colour photographs taken in the wild, and is essential reading for those interested in biodiversity of the region. A similar published field guide is based on our 3-year survey of the Tengchong forest of Gaoligongshan in Yunnan Province. We also produce popular readings and publicity materials for the general public and children, such as the Hainan Gibbon and Hainan Eld’s Deer storybooks which explain the conservation history of the two species in cartoon. Other publicity materials include brochures, posters, billboards, Chinese New Year red banners (Fai Chun), calendars, stickers, t-shirt, tote bags and of course, this information pack. Please contact us if you are interested in our publications: kcc@kfbg.org.

Project sites of Kadoorie Conservation China

嘉道理中国保育项目分布图



- | | | |
|---|---|---|
| 1. 霸王岭国家级自然保护区
Bawangling National Nature Reserve | 8. 云南闭壳龟保育
Yunnan Box Turtle Conservation | 15. “永续农业先锋”计划
Sustainable Agriculture Pioneers Scheme |
| 2. 鹦哥岭国家级自然保护区
Yinggeling National Nature Reserve | 9. 西双版纳国家级自然保护区
Xishuangbanna National Nature Reserve | 16. 唐家河国家级自然保护区
Tangjiahe National Nature Reserve |
| 3. 俄贤岭石灰岩森林
Exianling Limestone Forest | 10. 铜壁关省级自然保护区
Tongbiguan Provincial Nature Reserve | 17. 天马国家级自然保护区
Tianma National Nature Reserve |
| 4. 佳西省级自然保护区
Jiaxi Provincial Nature Reserve | 11. 高黎贡山国家级自然保护区
Gaoligongshan National Nature Reserve | 18. 山西华北豹保育
Shanxi North Chinese Leopard Conservation |
| 5. 海口羊山湿地
Haikou Yangshan Wetland | 12. 滇西北红外相机调查
Northwest Yunnan Camera Trap Survey | 19. 广东水獭保育
Guangdong Otter Conservation |
| 6. 邦溪省级自然保护区
Bangxi Provincial Nature Reserve | 13. 弄岗国家级自然保护区
Nonggang National Nature Reserve | 20. 柬埔寨生物多样性保育
Cambodia Biodiversity Conservation |
| 7. 吊罗山国家级自然保护区
Diaoluoshan National Nature Reserve | 14. 西大明山省级自然保护区
Xidamingshan Provincial Nature Reserve | |