Summary of Findings from some Rapid Biodiversity Assessments in West Guangxi, China, July 1999

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in collaboration with
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Background

The present report details the findings of visits to West Guangxi by members of Kadoorie Farm and Botanic Garden (KFBG) in Hong Kong and their colleagues, as part of KFBG's South China Biodiversity Conservation Programme. The overall aim of the programme is to minimise the loss of forest biodiversity in the region, and the emphasis in the first phase is on gathering up-to-date information on the distribution and status of fauna and flora.

Citation

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Contents

Translation of common Chinese geographical terms

Chinese Romanizations	English meaning
Bei	north
Dao	island
Dong	east
Feng shui	the Chinese system of geomancy
Feng, Ding	peak
Gang	harbour
Hai	sea
He, Chuan, Jiang	river
Hu, Chi	lake
Keng, Gu, Gou	valley, stream
Kou	outlet
Ling	range
Nan	south
Ping	flat
Shan	mountain
Shi	city
Tun	hamlet
Wan	bay
Xi	west
Xi, Yong	stream
Xian	county
Xiang, Cun	village

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Objectives

- The aims of these surveys were to collect up-to-date information on the fauna and flora of four nature reserves and one unprotected forest area visited during 1999, and to use this to help determine conservation priorities within South China.

Methods

- Fieldwork itineraries for each study site are listed in Table 1. Survey team members are shown in the *Contributors* list (page ii).
- During fieldwork visual searching for plants, mammals, birds, reptiles, amphibians, fish, ants, butterflies and dragonflies was conducted. Frogs and birds were also identified by their calls. Plant records were made by field observation, with some specimens collected.
- Vascular plant records (excluding Orchidaceae) were made by LGZ and TSC, and edited by NSC (Tables 2 and 3). The status of mammals was inferred (Table 4) based on direct findings (by LLR, LKS, ML, GTR or JRF), on interviews with reserve staff and residents of the study sites, and on recorded distributions, including past records from Jingxi, Napo and Daxin Counties (Wu M.C., 1993). Records of birds were made by LKS and ML (Table 5), reptiles and amphibians by ML (Table 6), fish by LHJ (Table 7), ants by JRF (Table 8), dragonflies by KW and GTR (Table 9) and butterflies by GTR (Table 10).
- Nomenclature in the report is standardised based, unless otherwise stated, on the following references:
  - Flora (Pteridophyta, Gymnospermae and Angiospermae excluding Orchidaceae): Anon. (1959-2001); Anon. (1991); Anon. (1996-2001); Anon. (2002a, 2002b); The Plant Names Project (2002);
  - Mammals (Mammalia): Wilson and Cole (2000);
  - Birds (Aves): Inskipp *et al*. (1996);
  - Reptiles and Amphibians (Reptilia and Amphibia): Zhao E.-M. and Adler (1993); Zhao E. *et al.* (2000);
  - Fish (Actinopterygii): Nelson (1994); Wu H.L. *et al.* (1999);
  - Ants (Insecta: Hymenoptera: Formicidae): named species according to Bolton (1995); unnamed species with reference numbers according to the collection currently held by KFBG.
  - Dragonflies (Insecta: Odonata): Schorr *et al.* (2001a, 2001b);
  - Butterflies (Insecta: Lepidoptera): Bascombe (1995).
- Information on the global status of species is from IUCN publications, notably IUCN (2002). Certain taxa, including reptiles, amphibians, fish and invertebrates, have yet to be

properly assessed for global status.

- Protected status in China is based on Hua and Yan (1993) for animals, and State Forestry Administration and Ministry of Agriculture (1999) for plants.
- Abbreviations/symbols used in the tables are as follows: CR = Critically Endangered globally; EN = Endangered globally; VU = Vulnerable globally; N/A = Not Available; ✪ = records of special conservation significance; ●●● = assemblage indicating high ecological integrity; ●● = assemblage indicating moderate to high ecological integrity; ● = assemblage indicating moderate to low ecological integrity.

Table 1. Summary table of site location, site management and fieldwork itinerary of five forest areas, West Guangxi, 1999.

	Gulongshan Nature Reserve (including Tongling Canyon)	Nongxin Nature Reserve	Nonghua Nature Reserve	Bailing Tun	Daxin Nature Reserve
Location	Southeastern Jingxi County bordering southern Debao County, southwest Guangxi [1].	Southeastern Napo County, southwest Guangxi [1].	Western Napo County, southwest Guangxi [1].	Northern Napo County southeast of Napo County Town, southwest Guangxi.	Central Daxin County, southwest Guangxi [1].
Coordinates	22° 50' – 23° 20'N, 106° 30' - 106° 50'E [1].	22° 55'N, 105° 53'E [1].	23° 14'-23° 20'N, 105° 33'-105° 35'E [1].	~ 23° 14'N, 105° 52'E	22° 42'-22° 48'N, 107° 01'-107° 15'E [1].
Status	Provincial Nature Reserve [2].	Provincial Nature Reserve [2].	Nature Reserve (provincial) [2].	Unprotected Feng Shui wood.	Nature Reserve (provincial) [2].
Establishment, aims	1982, to protect headwater forest ecosystems. Management station established in 1986 with 12 reserve staff in 1993 [1]. Classified by SEPA as a Forest Ecosystem Nature Reserve [2].	1982, to protect headwater forest ecosystem with management station established in the same year. Had 4 reserve staff in 1993 [1]. Classified by SEPA as a Forest Ecosystem Nature Reserve [2].	1982, to protect the headwater forest ecosystem. Had 2 reserve wardens but no management station in 1993 [1]. Classified by SEPA as a Forest Ecosystem Nature Reserve [2].	N/A	November 1980, mainly to protect rare animals such as *Trachypethicus francoisi* (Francois's Leaf Monkey) and Oriental Pied Hornbill (*Anthracoceros coronatus*) with management station established in the same year. Had 8 reserve staff in 1993 [1]. Classified by SEPA as a Wild Animal nature reserve [2].
Management authority	Forestry Department [3]	Forestry Department [3]	Forestry Department [3]	N/A	Forestry Department [3]
Size	297 km^2 [1,3]	105 km^2 [1,3]	48 km^2 [1], 134 km^2 [3]	Forest size less than one km^2	209 km^2 [1,3]
Geology, landscape, altitude	Geology dominated by limestone and granite. Mountainous landscape with karst and earth hills ranging from 250 m (Hurun Cun Hekou) to 1,310 m (Hong Shan) asl. Streams originating from Gulongshan flow into Zuo Jiang which feeds into Xi Jiang of the Zhujiang catchment [1].	Geology dominated by limestone and sandy shale. Mountainous landscape with karst and earth hills ranging from 259 m (Mengda) -1,232 m (Yanmenhoubei Shan) asl. Streams originate from Nongxin flow into Vietnam [1].	Geology dominated by limestone and sandy shale. Mountainous landscape with karst and earth hills ranging 380 (Nabu Valley) - 1,465 m (Niubei Shan) asl. Streams originate from Nonghua flow into Vietnam [1].	Geology dominated by limestone with karst formation.	Geology dominated by limestone. Hilly landscape with karst formation ranging from 100 - 608 m asl. Streams originate from Daxin flow into Zuo Jiang which feeds into Xi Jiang of the Zhujiang catchment [1].

	Gulongshan Nature Reserve (including Tongling Canyon)	Nongxin Nature Reserve	Nonghua Nature Reserve	Bailing Tun	Daxin Nature Reserve
Monthly temperature	Mean annual temp. 21°C, monthly mean temp. ranging from 13 °C (Jan) to 27°C (July) [1].	Mean annual temp. 19°C, monthly mean temp. ranging from 11 °C (Jan) to 24°C (July) [1].	Mean annual temp. 18°C (Absolute highest temp. 36°C) [1].	N/A but similar to Daxin NR	Mean annual temp. 21°C, monthly mean temp. ranging from 13°C (Jan) to 28°C (July) [1].
Annual rainfall	1,630 mm, mainly from Apr. to Sept. [1].	1,422 mm, mainly from May to Sept. [1].	1,422 mm [1].	N/A but similar to Daxin NR	1,365 mm [1]
Socio-economic	In 1993, there were 16 villages in six townships with a population of ~23,000. Average annual income was RMB 98 yuan per person [1].	In 1993, there were four villages with a population of ~5,600. Average annual income was RMB 73 yuan per person [1].	In 1993, there were five villages with a population of ~5,500. Average annual income was RMB 86 yuan per person [1].	N/A but believed to be similar to other areas of Napo County (e.g. Nonghua and Nongxin).	In 1993, there were 11 villages in three townships with a population of ~18,400. Average annual income was RMB 250 yuan per person [1].
KFBG fieldwork	**Gulongshan:** 10 July 1999 Part of the reserve between 365 and 525m asl. **Tongling Canyon:** 11 July 1999 (09.35-1100). Part of the reserve between 305 and 445m asl.	12 July 1999 Part of the reserve between 405 and 1,005m asl.	13 July 1999 Part of the reserve between 265 and 1,010m asl.	14 July 1999 Part of the forest between 850 and 1,000m asl	15 July 1999 Part of the reserve between 140 and 220 m asl.

Sources:
[1] Forestry Department of Guangxi Zhuang Autonomous Region, 1993. [2] Zhang, W., 1998. [3] MacKinnon *et al*., 1996. [4] Wu, M.C., 1993.

Summary tables of results

Table 2. Summary table of vegetation in five forest areas, West Guangxi, 1999.

	Gulongshan Nature Reserve	Nongxin Nature Reserve	Nonghua Nature Reserve	Bailing Tun	Daxin Nature Reserve
Zonal vegetation Vegetation	Northern tropical seasonal rainforest [1]. Original vegetation on limestone hillsides would have been forest dominated by *Excentrodendron hsienmu, Cinnamomum saxatile* and *Garcinia paucinervis*. Forest on earth hills should be secondary forest dominated by *Cyclobalanopsis* spp., *Schima wallichii* and *Liquidambar formosana* [1]. Reported natural forest cover 133 km^2 (45% of reserve area) in 1993. Vegetation of the areas visited in the present survey was fairly degraded and mainly comprised tall shrubland. Most of the flat area and ravines had been transformed to agricultural land. Small patches of secondary forests could still be found on the tops and some ravines of limestone hills. The limestone hills around Gantun of Da'ai Village was mainly secondary forest less than 5 m tall. Tongling Canyon had a relatively good karst forest patch with trees about 10-15 m tall.	Northern tropical seasonal rainforest [1]. Original vegetation on limestone hills should be forest dominated by *Excentrodendron hseimu*, *Sterculia pexa*, *Engelhardtia roxburghiana* and *Choerospondias axillaris*. Forest on shale hills was dominated by *Canarium* spp., *Caryota* spp., *Saurauia tristyla* and *Cleidiocarpon cavaleriei* [Li G.Z. *in litt.* 1999]. Natural forest reportedly covered 46 km^2 (43% of reserve area) in 1993 [1]. The area visited in the present survey had been largely degraded to secondary shrubland. Lowland and shallower slopes had all been transformed to cornfields and the expected dominant *E. hseimu* could not be seen. Small patches of secondary forest 5-15m tall and less than 80cm dbh, dominated by *Macaranga denticulata*, *Trema angustifolia*, *Radermachera sinica*, *Alangium chinense*, and *Schefflera octophylla*, could be found on inaccessible hillsides above 800m.	Northern tropical seasonal rainforest [1]. Original vegetation on limestone hillsides would have been forest dominated by *Excentrodendron hseimu* and *Garcinia paucinervis* between 800 and 1,150m, and mixed evergreen and deciduous broadleaf forest between 1,200 and 1,400m, dominated by trees such as *Castanopsis sclerophylla*, *Crytocarya* spp., *Machilus* spp., *Delavaya yunnanensis*, and *Celtis* spp. Well-preserved natural forest reportedly covered 48 km^2 in 1993, mainly around Nonghua Cun and Longmen range [1]. The area visited in the present survey was mainly mixed evergreen and deciduous secondary forest and tall shrubland. Secondary forest, 10-15m tall, was dominated by *Zenia insignis*, *Lysidice rhodostegia*, *Mallotus philippinensis*, *Dalbergia hupeana*, *Erythrina variegata* and *Oroxylum indicum*. Tall shrubland 4-6m tall was mainly dominated by *Macaranga denticulata*, *Coriaria nepalensis*, *Trema angustifolia*, *Bauhinia glauca* and *Psidium guajava*.	N/A but similar to Daxin NR. The original vegetation would have been forest similar to that originally at Nongxin, Nonghua and Daxin. At the time of our visit the area was mainly degraded limestone hillside with cornfields. Above 800m on a limestone hill behind the village (i.e. Bailing Tun), closed-canopy secondary forest, with trees up to 10 m tall and 30 cm dbh, was preserved as a feng shui wood. Dominant species included *Cladrastis platycarpa, Celtis biondii, C. tetrandra* ssp. *sinensis, Wrightia sikkimensis, Sterculia lanceolata* and *Caryota ochlandra.*	Northern tropical seasonal rainforest [1]. Original vegetation should be forest dominated by *Excentrodendron hsienmu* and *Garcinia paucinervis.* Natural forest reportedly covered 23 km^2 (11% of reserve area) in 1993 [1]. The area visited in the present survey had been largely degraded to secondary tall shrubland about 3-5m tall, with only small patches of remnant forest remaining above 500m. Dominant species included *Liquidambar formosana*, *Dracaena angustifolia*, *Sterculia nobilis*, *Croton euryphyllus*, *Cipadessa cinerascens*, *Caesalpinia minax* and *Bauhinia championii*. Tall grassland dominated by the exotic weed *Eupatorium odoratum* was found in the foothills.

Table 3. Summary table of vascular plants (excluding Orchidaceae) recorded in five forest areas, West Guangxi, July 1999.

	Gulongshan Nature Reserve	Nongxin Nature Reserve	Nonghua Nature Reserve	Bailing Tun	Daxin Nature Reserve
Vascular plants	Brief survey recorded only 72 vascular plant species in 40 families. Include ✪***Excentrodendron hsienmu*** **(VU)**, ***Toona ciliata*** and ✪***Caryota urens*** **(both Protected II)**. ✪*Aesculus chuniana* is endemic to southwest Guangxi. ✪*Bolbostemma biglandulosum* is a new record for Guangxi and is restricted to SE Yunnan and SW Guangxi. *Maesa tenera* is a new record for Guangxi. Earlier survey recorded ~800 vascular plant species [1], including ✪***Garcinia paucinervis*** **(EN)** and ✪***Cephalomappa sinensis*** **(VU)**. ✪***Zenia insignis*** **(Protected II)** is restricted to limestone areas of Guangdong, Guangxi & Vietnam. ●●	Brief survey recorded only 37 plant species. Include ✪***Caryota urens*** **(Protected II)**. ✪*Metabrigsia ovalifolia* is endemic to Guangxi. *Paris polyphylla* var. *yunnanensis* and *Kingidium braceanum* are new records for Guangxi. Earlier survey had recorded ✪***Excentrodendron hsienmu*** **(VU)** and ✪***Pseudotsuga brevifolia*** **(Protected II)** [1]. ●●	Brief survey recorded only 42 vascular plant species in 27 families. Include ✪***Zenia insignis*** **(Protected II)**, ***Toona ciliata*** **(Protected II)**. ✪*Whitfordiodendron filipes* var. *tomentosum* is a new record for Guangxi and restricted to Yunnan and Guangxi. Earlier survey had recorded ✪***Excentrodendron hsienmu*** **(VU)**, ✪***Garcinia paucinervis*** **(EN)** and ✪***Pseudotsuga brevifolia*** **(Protected II)** [1]. ●●	Brief survey recorded only 15 plant species. No species of conservation concern recorded. ●	Brief survey recorded only 47 plant species with no threatened species found. Earlier survey had recorded ✪***Excentrodendron hsienmu*** **(VU)**, ✪***Garcinia paucinervis*** **(EN)** and ✪***Cephalomappa sinensis*** **(VU)** [1]. ●

Table 4. Summary table of the inferred status of mammals in five forest areas, West Guangxi, July 1999, based on interviewing staff and residents, observation records and past distribution records (Wu M.C., 1993). Interview records: "--" = absent, "+" = present, "N" = not asked; observation records: "#" = heard, seen or signs observed; past records: "✓ " = reported from respective counties. Sequence follows Wilson & Cole (2000), synonyms commonly used by Chinese scientists are included in brackets.

Scientific name	English name	Gulongshan Nature Reserve	Nongxin Nature Reserve (resident)	Nonghua Nature Reserve	Bailing Tun	Daxin Nature Reserve (resident)	Probable status
Tupaia belangeri (including records as *T. glis*)	Northern Tree Shrew	+	+	N	N	+	present
Nycticebus coucang	Slow Loris	-- ✓	-- ✓	-- ✓	-- ✓	--	extirpated or insecure
Macaca assamensis	Assam Macaque	+ ✓	+ ✓	N ✓	N ✓	-- ✓	insecure
Macaca mulatta	Rhesus Monkey	# (sign)	# (seen)	N ✓	N ✓	+ # (sign)	present (confirmed)
Macaca "nemestrina" (more probably *M. leonina*)	Pigtail Macaque	-- ✓	-- ✓	N ✓	N ✓	--	extirpated or insecure
Trachypithecus (recorded as *Semnopithecus* or *Presbytis) francoisi*	Francois's Leaf Monkey	+ ✓	--✓	N ✓	N ✓	++ ✓	insecure
Nomascus (cf. *nasutus*) sp.	Eastern Black Crested Gibbon	-- ✓	--	N	N	--	extirpated
Canis lupus	Grey Wolf	--	--	N	N	+	extirpated
Cuon alpinus	Dhole	--	+	N	N	--	extirpated or insecure

Scientific name	English name	Gulongshan Nature Reserve	Nongxin Nature Reserve (resident)	Nonghua Nature Reserve	Bailing Tun	Daxin Nature Reserve (resident)	Probable status
Vulpes vulpes	Red Fox	+	+	N	N	+	insecure
Catopuma (as *Felis*) *temminckii*	Asiatic Golden Cat	-- ✓	-- ✓	N ✓	N ✓	+ ✓	extirpated or insecure
Prionailurus (as *Felis*) *bengalensis*	Leopard Cat	+	+	N	N	+	insecure
Neofelis nebulosa	Clouded Leopard	+ ✓	-- ✓	N ✓	N ✓	✓	extirpated or insecure
Panthera pardus	Leopard	--	+	N	N	--	extirpated or insecure
Herpestes urva	Crab-eating Mongoose	--	--	N	N	# (seen)	present (confirmed, seen crossing road on 14 July)
Arctonyx collaris	Hog Badger	+	--	N	N	--	extirpated or insecure
Meles meles	Eurasian Badger	--	--	N	N	+	extirpated or insecure
Melogale moschata	Chinese Ferret-badger	+	+	N	N	+	present
Mustela kathiah	Yellow-bellied Weasel	+	+	N	N	+	present
Mustela sibirica	Siberian Weasel	+	--	N	N	--	insecure
Ursus (as *Selenarctos) thibetanus*	Asiatic Black Bear	--	--	+ (resident of Baidu Xiang reported having caught and sold a cub in 1998)	N	--	extirpated or insecure
Chrotogale owstoni	Owston's Palm Civet	-- ✓	-- ✓	N ✓	N ✓	-- ✓	extirpated, insecure or absent
Paguma larvata	Masked Palm Civet	+	+	N	N	+	present
Paradoxurus hermaphroditus	Asian Palm Civet	✓	+ ✓	N ✓	N ✓	✓	insecure
Viverra zibetha	Large Indian Civet	--	--	N	N	--	extirpated or insecure
Viverricula indica	Small Indian Civet	+	--	N	N	--	extirpated or insecure
Sus scrofa	Wild Boar	+	+	N	N	+	present
Moschus berezovskii	Chinese Forest Musk Deer	+	+	N	N	--	insecure
Cervus unicolor	Sambar	-- ✓	-- ✓	N ✓	N ✓	--	extirpated or insecure
Muntiacus sp(p). (*M. muntjak* or *M. reevesi*)	Indian and/or Reeves's Muntjac	+	--	N	N	+	insecure
Manis pentadactyla	Chinese Pangolin	+	+	N	N	+	insecure
Callosciurus erythraeus	Pallas's Squirrel	# (heard)	+	N # (heard)	N	--	present
Ratufa bicolor	Black Giant Squirrel	-- ✓	-- ✓	N ✓	N ✓	--	extirpated or insecure
Tamiops maritimus (as *T. swinhoei*)	Maritime Striped Squirrel	+	+	N	N	+	present
Belomys pearsonii	Hairy-footed Flying Squirrel	-- ✓	+ ✓	N ✓	N ✓	+	present
Petaurista philippensis (*P. petaurista*)	Indian (or Red) Giant Flying Squirrel	+	+	N	N	--	present
Trogopterus xanthipes	Complex-toothed Flying Squirrel	-- ✓	-- ✓	N ✓	N ✓	--	extirpated or insecure
Rhizomys pruinosus	Hoary Bamboo Rat	+	+	N	N	+	present

Scientific name	English name	Gulongshan Nature Reserve	Nongxin Nature Reserve (resident)	Nonghua Nature Reserve	Bailing Tun	Daxin Nature Reserve (resident)	Probable status
Atherurus macrourus	Asiatic Brush-tailed Porcupine	+	+	N	N	+	present
Hystrix brachyura (as *H. hodgsoni)*	Malayan Porcupine	--	+	N	N	+	present
Lepus sinensis	Chinese Hare	--	+	N	N	--	extirpated or insecure

Table 5. Summary table of birds recorded in five forest areas, West Guangxi, July 1999.

	Gulongshan Nature Reserve	Nongxin Nature Reserve	Nonghua Nature Reserve	Bailing Tun	Daxin Nature Reserve
Birds	Recorded 46 species. Most frequent: Red-whiskered Bulbul *Pycnonotus jocosus*, Streak-breasted Scimitar Babbler *Pomatorhinus ruficollis* and Hill Prinia *Prinia atrogularis*. Also some species recorded infrequently during KFBG's South China surveys (e.g. Black-throated Sunbird *Aethopyga saturata*), but not especially dependent on forest nature reserves. ●	Recorded 35 species. Most frequent: Golden-throated Barbet *Megalaima franklinii*, Mountain Bulbul *Hypsipetes mcclellandii*, and Striated Yuhina *Yuhina castaniceps*. ✪Mountain Bamboo Partridge *Bambusicola fytchii* is a new record for Guangxi. ●	Recorded 41 species. Most frequent: White-browed Laughingthrush *Garrulax sannio*, Striated Yuhina *Yuhina castaniceps*, Grey-breasted Prinia *Prinia hodgsonii*, and White-rumped Munia *Lonchura striata*. Also some species recorded infrequently during KFBG's South China surveys (e.g. Yellow-eyed Babbler *Chrysomma sinense*), but not especially dependent on forest nature reserves. ●	Recorded 17 species. Most frequent: Red-whiskered Bulbul *Pycnonotus jocosus* and Grey-breasted Prinia *Prinia hodgsonii*. ✪ Common Kestrel *Falco tinnunculus* (Protected II). ●	Recorded 21 species. Most frequent: Red-whiskered Bulbul *Pycnonotus jocosus*, Grey-breasted Prinia *Prinia hodgsonii*, and Common Tailorbird *Orthotomus sutorius*. ✪ Greater Coucal *Centropus sinensis* (Protected II). ●

Table 6. Summary table of amphibians and reptiles in five forest areas, West Guangxi, July 1999.

	Gulongshan Nature Reserve	Nongxin Nature Reserve	Nonghua Nature Reserve	Bailing Tun	Daxin Nature Reserve
Reptiles	Recorded three species (*Sphenomorphus indicus, Amphiesma popei* and *Xenochrophis piscator*). None are especially dependent on forest. ●●	None recorded.	Recorded one species (*Ptyas mucosus*), which is not especially dependent on forest. ●	None recorded.	Recorded three species (*Calotes versicolor, Takydromus sexlineatus* and *Eumeces chinensis*). None are especially dependent on forest. ●
Amphibians	Recorded six species (*Rana limnocharis*, *R. rugulosa, Polypedates megacephalus, Microhyla heymonsi, Microhyla ornata* and *Microhyla pulchra*). None are especially dependent on forest. ●●	Recorded three species (*Rana guentheri, Rana limnocharis* and *Microhyla pulchra*). None are especially dependent on forest. ●	Recorded one species (*Rana limnocharis*), not especially dependent on forest. ●	Recorded four species (*Bufo melanostictus, Rana limnocharis, Polypedates megacephalus* and *Microhyla pulchra*). ●	Recorded three species (*Rana guentheri*, *R. limnocharis* and *Microhyla pulchra*). None are dependent on forest. ●

Table 7. Summary table of freshwater fish recorded in five forest areas, West Guangxi, July 1999.

	Gulongshan Nature Reserve	Nongxin Nature Reserve	Nonghua Nature Reserve	Bailing Tun	Daxin Nature Reserve
Freshwater fishes	Seven species reported: *Zacco platypus,* ✪*Carassioides cantonensis, Schistura fasciolata,* ✪*Balitora kwangsiensis, Pterocryptis* sp.*, Gambusia affinis* and *Macropodus opercularis. C. cantonensis* and *B. kwangsiensis* have not been recorded on KFBG surveys and are restricted globally. *G. affinis* is an invasive alien species. No specimens have been examined by specialists and the identities could not be verified. ●●	Data not available.	Data not available.	Not surveyed.	Data not available.

Table 8. Summary table of ant species recorded in five forest areas, West Guangxi, July 1999.

	Gulongshan Nature Reserve	Nongxin Nature Reserve	Nonghua Nature Reserve	Bailing Tun	Daxin Nature Reserve
Ants	Recorded 32 species. ✪*Aenictus* sp. 8 has not been recorded elsewhere; ✪*Camponotus* sp. 48 known only from Jingxi County. 34% of species forest specialists. ●●	Recorded 46 species. 39% of species forest specialists. ●●	Recorded 39 species. 41% of species forest specialists. ●●	Recorded 24 species. □*Dacatria* sp. 1 has not been recorded elsewhere. 39% of species forest specialists. ●●	Recorded 26 species. Only 19% of species forest-specialists. ●

Table 9. Summary table of dragonflies recorded in five forest areas, West Guangxi, July 1999.

	Gulongshan Nature Reserve	Nongxin Nature Reserve	Nonghua Nature Reserve	Bailing Tun	Daxin Nature Reserve
Dragonflies	Recorded 9 species (*Prodasineura autumnalis, Orthetrum chrysis, O. pruinosum, O. sabina, O. triangulare, Crocothemis servilia, Trithemis aurora , Trithemis festiva* and *Pantala flavescens*). None especially dependent on forest. ●	Recorded 2 species (*Orthetrum sabina* and *Pantala flavescens*). None dependent on forest. ●	Recorded 6 species (*Orthetrum glaucum, O. pruinosum, O. sabina, Crocothemis servilia, Neurothemis fulvia* and *Pantala flavescens*). None are dependent on forest. ●	Recorded 5 species (*Orthetrum glaucum, O. sabina, Trithemis aurora, Trithemis festiva* and *Pantala flavescens*). None dependent on forest. ●	Recorded 12 species (*Euphaea decorata, Copera marginipes, Ictinogomphus pertinax, Orthetrum glaucum, O. pruinosum, O. sabina, O. triangulare, Crocothemis servilia, Brachythemis contaminata, Pseudothemis zonata, Pantala flavescens* and *Tramea virginia*). None are especially dependent on forest. ●

Table 10. Summary table of butterfly species recorded in five forest areas, West Guangxi, July 1999.

	Gulongshan Nature Reserve	Nongxin Nature Reserve	Nonghua Nature Reserve	Bailing Tun	Daxin Nature Reserve
Butterflies	Recorded 35 species in the disturbed and degraded habitats visited. ✪*Papilio castor* has not previously been encountered on KFBG surveys and may therefore be tentatively considered rare in South China. ●	Recorded 21 species. A few good forest indicators were recorded in the forest at the hilltop. These included *Lethe europa*, *Stibochiona nicea*, *Loxura atymnus* and *Tongeia potanini*. ●●	Recorded 12 species. All typical of open disturbed habitats. ●	Recorded 21 species, none of which were particularly notable. ●	Recorded 55 species. These were mainly typical of mixed open habitats, although *Stiboges nymphidia* is usually associated with forest (and was encountered in the shrubby woodland on the middle slopes of the hill). ●

Summary of overall biota

Table 11. Assessment of fauna and flora recorded in five forest areas, West Guangxi, July 1999.

	Gulongshan Nature Reserve	Nongxin Nature Reserve	Nonghua Nature Reserve	Bailing Tun	Daxin Nature Reserve
Overall biota	The areas surveyed were very degraded, and dominated by tall shrubland and secondary forest. Relatively good karst forest could be found at Tongling Canyon. Brief botanical survey recorded only 72 species, though three globally Threatened and nationally Protected plants and two new records for Guangxi were found. Despite the degraded forest, mammal species of conservation concern, such as macaques, Francois's Leaf Monkey, Clouded Leopard, Chinese Forest Musk Deer and Chinese Pangolin were reported to be present. However, the future of these species, if they still occur, is doubtful unless drastic measures to prevent habitat destruction and hunting are implemented immediately. Due to the geographical location, there were bird species (e.g. Black-throated Sunbird) rarely encountered in KFBG's surveys, but most are typical of degraded forest/shrubland habitat. Some species of fish reported are of conservation concern but these records need to be verified by specialists. One ant species has not been recorded elsewhere. The dragonfly fauna was unexceptional. One species of butterfly has not been recorded elsewhere during KFBG surveys.	Much of the area surveyed had been transformed to shrubland and farmland. Patches of relatively good secondary forest could be seen on inaccessible hillsides above 800m. Brief botanical survey recorded only 37 species, including one nationally Protected species and two new records for Guangxi. Mammal species of conservation concern, such as macaques, Dhole, Leopard, Chinese Forest Musk Deer, Chinese Pangolin, Hairy-footed Flying Squirrel and porcupines were reported to be present. However, the future of these species, if they still occur, should be considered doubtful. Due to the geographical position, there were bird species (e.g. Golden-throated Barbet and Mountain Bamboo Partridge) rarely encountered in KFBG's surveys, but most are typical of degraded forest/shrubland habitat. The dragonflies were unexceptional. A number of forest-dependent species of butterfly were found in the fragmented forest patches in the study site.	The surveyed area was mainly mixed evergreen and deciduous secondary forest and tall shrubland. Brief botanical survey recorded only 42 species, including two globally Threatened and nationally Protected plants, and one new record for Guangxi. The reported occurrence of Asiatic Black Bear needs further investigation and would add to the reserve's conservation value. However, the future of such endangered species should be considered doubtful. Due to the geographical position, there were bird species (e.g. Yellow-eyed Babbler) rarely encountered in KFBG's surveys, but most are typical of degraded forest/shrubland habitat. The dragonfly and butterfly fauna recorded were unexceptional both in terms of species richness and abundance.	The surveyed area had been largely transformed to farmland, except on one limestone hill where closed-canopy forest was preserved as feng shui wood. Brief botanical survey recorded only 15 species, with none of conservation concern. The forest block visited was isolated and very small in size, and of minimal value for larger fauna. The bird, dragonfly and butterfly fauna were unexceptional. One ant species found has not been recorded elsewhere.	The surveyed area was mainly tall shrubland on hillsides and tall grassland at the foothills of the limestone hills. Small patches of remnant forest could only be found on hillsides above 500m. Brief survey only recorded 47 plant species including no forest or threatened species. Despite the degraded forest, mammal species of conservation concern, such as macaques, Francois's Leaf Monkey, Asiatic Golden Cat, Chinese Pangolin, Hairy-footed Flying Squirrel and the porcupines were reported to be present. However, the future of these species, if they still occur, should be considered doubtful. The bird fauna was unexceptional, and the protected species recorded are typical of degraded forest/shrubland habitat. The dragonfly fauna was unexceptional. One forest-dependent butterfly species was found in the fragmented forest patches.

Threats and problems

Logging, clearance for agricultural monoculture and direct exploitation appear to have eliminated most of the biodiversity in the study area. The villagers are amongst the poorest in Guangxi, which in turn is amongst the poorest provinces in China. Nature conservation is unlikely to be effective unless livelihoods of the community are improved. In particular there is an urgent need for sources of income alternative to the current production models which are undermining their own sustainability and resilience as well as destroying ecological integrity.

Opportunities

Effective conservation in the west Guangxi area would call for a strategy involving an urgent survey to detect the more natural ecosystems and ensure these are effectively protected by residents, while alternative sustainable income sources are explored. Ecological restoration would seem essential to any long-term effort at poverty resolution and biodiversity conservation.

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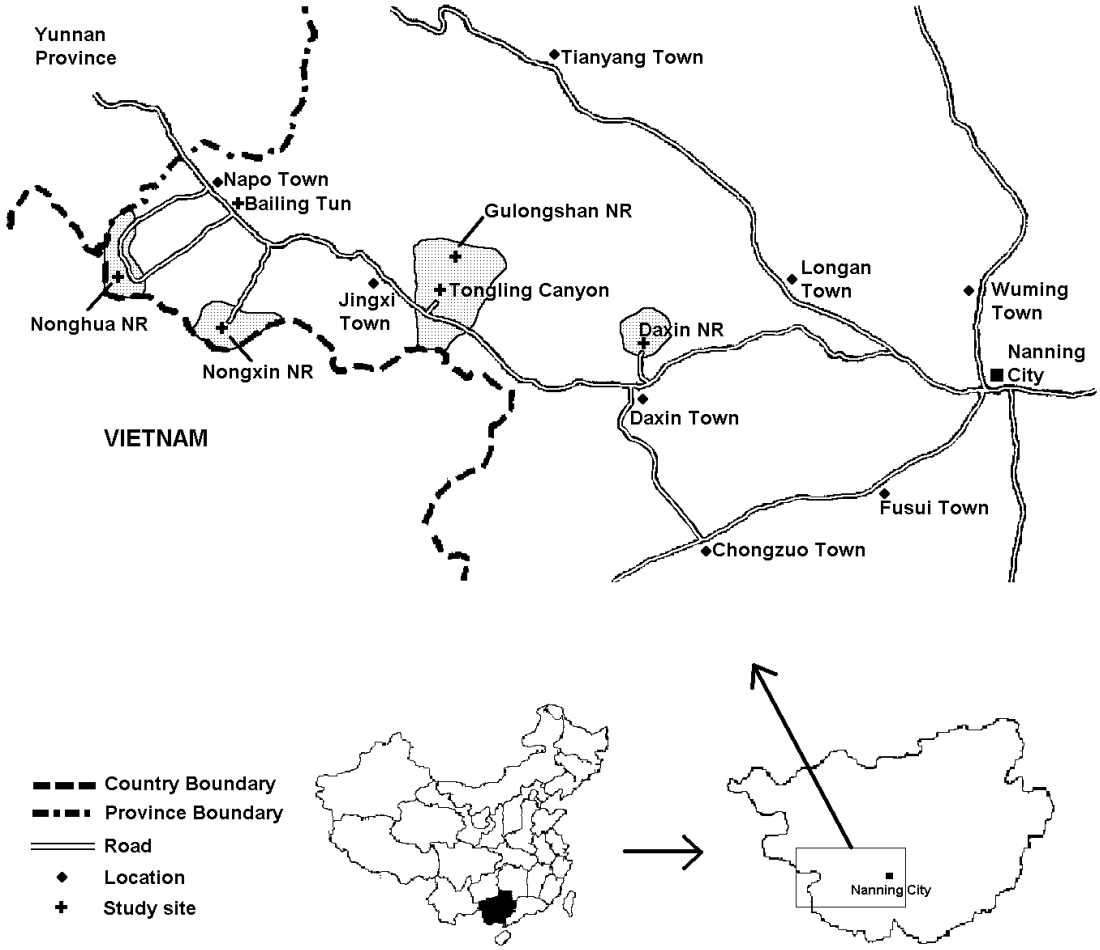

Figure 1. Map showing location of forest areas visited in July 1999, West Guangxi, China.