Report of Rapid Biodiversity Assessment at Heweishan Forest Farm, Southwest Guangdong, 4 to 5 May 1998

Kadoorie Farm and Botanic Garden
in collaboration with
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South China Institute of Botany
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Background

The present report details the findings of a trip to Southwest Guangdong by members of Kadoorie Farm & 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 three years is on gathering up-to-date information on the distribution and status of fauna and flora.

Citation

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Common geographical descriptions and their Chinese phonetics

English meaning	Chinese phonetics (pinyin)
East	dong
South	nan
West	xi
North	bei
mountain	shan
range	ling
peak	feng, ding
valley	keng, gu
island	dao
river	he, chuan, jiang
stream	xi, yong
lake	hu, chi
sea	hai
harbour	gang
bay	wan
outlet	kou
city	shi
county	xian
village	xiang, cun
hamlet	tun

Report of a Rapid Biodiversity Assessment at Heweishan Forest Farm, Southwest Guangdong, 4 to 5 May 1998

Objectives

The hills of Heweishan were reported by Yangchun City Forestry Bureau officials to hold forest of conservation interest. In the early 1990s, the Bureau applied to list the site as a nature reserve. This brief survey aimed to provide data of relevance to this proposal. At the time of writing, the Heweishan area has been designated as the Ehuangzhang County-level Nature Reserve (Chen W. S., Guangdong Forestry Department, pers. comm. Dec. 2001).

Methods

On 4-5 May, following rapid biodiversity assessments at Qixingkeng Nature Reserve (Kadoorie Farm and Botanic Garden, 2002a) and Yangchun Baiyong Nature Reserve (Kadoorie Farm and Botanic Garden, 2002b), the survey team (CBH, JRF, BH, ML, LKS, LHJ, LZC, GTR, WRJ, XMY) conducted a rapid biodiversity survey at Heweishan Forest Farm.

During fieldwork visual searching for plants, mammals, birds, reptiles, amphibians, fish, ants, butterflies and dragonflies was conducted. Estimates of the status of large and medium-sized mammals (excluding Erinaceidae, Talpidae, Soricidae, Muridae and Chiroptera) at Heweishan were largely based on an interview with a forest farm warden, with reference to colour pictures. For these purposes, a list of South China mammals was compiled from various sources including Guangdong Forestry Department & South China Institute of Endangered Animals (1987), Corbet & Hill (1992) and Zhang (1997).

Plant records in the surveys were made or verified by CBH, XMY or WRJ, and edited by NSC, except in the case of orchids, which were verified by GS. Records of birds were made or verified by LKS, reptiles and amphibians by ML or LZC, fish by BC and CXL, ants by JRF, butterflies by GTR, dragonflies by GTR and KW of Hong Kong, and rove beetles by GDR, formerly of Hong Kong.

- Nomenclature in the report is standardised based, unless otherwise stated, on the following references:
- Flora (Pteridophyta, Gymnospermae and Angiospermae excluding Orchidaceae): Anon. (1959-2000); Anon. (1996-2000); Anon. (2001); The Plant Names Project (2001);
- Orchids (Angiospermae: Orchidaceae): Chen (1999); Tsi (1999); Lang (1999); De Vogel & Turner (1992);
- Mammals (Mammalia): D.E. Wilson & Reeder (1993); D.E. Wilson & Cole (2000);
- Birds (Aves): Inskipp *et al*. (1996);
- Reptiles & Amphibians (Reptilia and Amphibia): Zhao E. *et al.* (2000);
- Fish (Actinopterygii): Nelson (1994); Wu *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);
- Rove Beetles (Insecta: Coleoptera: Staphylinidae): G. de Rougemont (unpublished).

Information on the global status of species is from IUCN publications, notably Hilton-Taylor (2000) and the Internet site (IUCN Species Survival Commission, 2001). National conservation status of orchids is based on Wang *et al.* (in press). Protection status in China is based on Hua & Yan (1993) for animals and State Forestry Administration & Ministry of Agriculture (1999) for plants. Provincial protection status is from Guangdong Provincial Environmental Protection Bureau & South China Institute of Botany (1988). Certain taxa, including orchids, reptiles, amphibians, fish and invertebrates, have yet to be properly assessed for global status.

Location and management

Heweishan is located at 111° 7′ E and 21°53′ N, at the southwest corner of Yangchun City in Yangjiang Municipality, and adjacent to Yangxi County and Dianbai County in Maoming Municipality. The highest peak, Ehuangzhang (1,337 m), is on the southeastern border of Yangchun. The total area of Heweishan is about 160 km^2 (Yangchun City Forestry Bureau, 1994), with 15 km^2 of forest around the Xianjiadong Reservoir. Heweishan has rich hydropower resources. Currently, the hydropower plants in Xianjiadong Reservoir and Honghuatan provide much of the electricity in the region. In view of the economic importance of the forests at Heweishan for hydropower, and the increasing value of Xianjiadong Reservoir as a local tourism destination, in the early 1990s Yangchun City Forestry Bureau submitted a proposal to Guangdong Province Forestry Department to designate Heweishan as a nature reserve (Yangchun City Forestry Bureau, 1994). It was established as the Ehuangzhang County-level Nature Reserve in May 2001 under the management of the Yangchun City Forestry Bureau (Chen W.S., Guangdong Forestry Department, pers. comm. Dec. 2001).

Results

Vegetation

The zonal vegetation of Heweishan Forest Farm is southern subtropical monsoon evergreen broadleaf forest. The existing vegetation can be broadly divided into the following types:

(1) Southern subtropical monsoon evergreen broadleaf forest occupies a rather large area and is distributed on hillsides at lower altitude. The dominant species are *Cryptocarya chinensis*, *Helicia longipetiolata*, *Gordonia axillaris*, *Anneslea fragrans* var. *rubriflora*, *Sterculia lanceolata* and *Schefflera octophylla*.

(2) Southern subtropical montane broadleaf forest also occupies a large area, at middle altitudes. The dominant species are *Machilus chinensis*, *Rhodoleia championii*, *Helicia reticulata*, *Castanopsis fissa* and *Reevesia thyrsoidea*.

(3) Southern subtropical mixed evergreen coniferous and broadleaf forest covers a rather large area and is distributed on mountain areas near the summit at higher altitudes. The dominant species are *Pinus massoniana*, *Schima superba*, *Lithocarpus macilentus* and *Castanopsis fissa*. This vegetation type represents a succession from the early successional *Pinus* forest to secondary broadleaf forest.

(4) Hillside scrub-grassland is commonly found on deforested ridges and summits. It is formed as a result of prolonged disturbances, resulting in open and impoverished vegetation. The dominant species are *Rhodomyrtus tomentosa*, *Baeckea frutescens*, *Miscanthus sinensis* and *Thysanolaena maxima*.

Flora

This survey recorded 188 vascular plant species, including 13 ferns in 11 families, one gymnosperm, and 174 angiosperms in 74 families (Table 1). The relatively low number of species found compared, for example, with Qixingkeng is probably due to insufficient survey effort, as

only one and a half days were spent at Heweishan. The flora was dominated by tropical and subtropical families such as Rubiaceae, Lauraceae, Euphorbiaceae, Fagaceae and Theaceae.

Table 1. Vascular plant species recorded at Heweishan in this survey. Species which are nationally protected (Class I or II) (State Forestry Administration & Ministry of Agriculture, 1999), globally Threatened or Lower Risk (Near-threatened) (IUCN Species Survival Commission, 2001) or endemic are indicated.

Family	Scientific name	Remarks
PTERIDOPHYTA		
Blechnaceae	*Blechnum orientale* L.	
Dicksoniaceae	*Cibotium barometz* (L.) J. Sm.	Protected II
Drynariaceae	*Pseudodrynaria coronans* (Wall. ex Mett.) Ching	
Gleicheniaceae	*Dicranopteris pedata* (Houtt.) Nakaike	
Lindsaeaceae	*Lindsaea heterophylla* Dryand.	
	Stenoloma chusanum (L.) Ching	
Lycopodiaceae	*Lycopodiastrum casuarinoides* (Spring) Holub	
	Palhinhaea cernua (L.) Franco et Vasc.	
Lygodiaceae	*Lygodium japonicum* (Thunb.) Sw.	
Nephrolepidaceae	*Nephrolepis auriculata* (L.) Trimea	
Osmundaceae	*Osmunda vachellii* Hook.	
Pteridaceae	*Pteris semipinnata* L.	
Sinopteridaceae	*Onychium japonicum* (Thunb.) Kunze	
GYMNOSPERMAE		
Pinaceae	*Pinus massoniana* Lamb.	
ANGIOSPERMAE		
Dicotyledonae		
Actinidiaceae	*Saurauia tristyla* DC.	
Anacardiaceae	*Toxicodendron succedaneum* (L.) Kuntze.	
Annonaceae	*Uvaria grandiflora* Roxb.	
	Uvaria microcarpa Champ. ex Benth.	
Apiaceae	*Torilis japonica* (Houtt.) DC.	
Apocynaceae	*Melodinus suaveolens* Champ. ex Benth.	
Aquifoliaceae	*Ilex macrocarpa* Oliv.	
	Ilex pubescens Hook. et Arn.	
Araliaceae	*Schefflera octophylla* (Lour.) Harms	
Aristolochiaceae	*Asarum insigne* Diels	
Asteraceae	*Ageratum conyzoides* L.	introduced from tropical America
	Cotula anthemoides L.	
	Crassocephalum crepidioides (Benth.) S. Moore	introduced from Africa
	Eclipta prostrata (L.) L.	
	Elephantopus scaber L.	
	Emilia sonchifolia (L.) DC.	pantropical weed
	Epaltes australis Less.	pantropical weed
	Gnaphalium affine d'Urv.	
	Ixeridium gracile (DC.) C. Shih	
	Soliva anthemifolia (Juss.) R. Br.	
	Vernonia cinerea (L.) Less.	pantropical weed
	Wedelia chinensis (Osbeck) Merr.	
Boraginaceae	*Ehretia longiflora* Champ. ex Benth.	
Burmanniaceae	*Burmannia disticha* L.	
Buxaceae	*Buxus megistophylla* Levl.	
Caesalpiniaceae	*Bauhinia championii* (Benth.) Benth.	
Campanulaceae	*Pratia nummularia* (Lam.) A. Br. et Aschers.	
Caprifoliaceae	*Lonicera confusa* (Sweet) DC.	
	Viburnum odoratissimum Ker Gawl.	
	Viburnum sempervirens Koch	
Caryophyllaceae	*Polycarpon prostratum* (Forssk.) Asch. & Schweinf. ex Asch.	
Celastraceae	*Euonymus laxiflorus* Champ. ex Benth.	

Family	Scientific name	Remarks
Chloranthaceae	*Sarcandra glabra* (Thunb.) Nakai	
Clusiaceae	*Cratoxylum cochinchinense* (Lour.) Blume	
	Hypericum japonicum Thunb. ex Murray	
Connaraceae	*Rourea microphylla* (Hook. & Arn.) Planch.	
Daphniphyllaceae	*Daphniphyllum macropodum* Miq.	
Dilleniaceae	*Tetracera asiatica* (Lour.) Hoog.	
Droseraceae	*Drosera spathulata* Labill. var. *loureiri* (Hook. & Arn.) Y.Z. Ruan	
Elaeocarpaceae	*Elaeocarpus varunua* Buch.-Ham.	
Ericaceae	*Lyonia ovalifolia* (Wall.) Drude var. *lanceolata* (Wall.) Hand.-Mazz.	
	Vaccinium subfalcatum Merr. ex Sleumer	
Euphorbiaceae	*Alchornea trewioide*s (Benth.) Müell. Arg.	
	Aporosa dioica (Roxb.) Müll. Arg.	
	Bridelia tomentosa Blume	
	Endospermum chinense Benth.	
	Mallotus barbatus (Wall.) Müll. Arg.	
	Sapium discolor (Champ. ex Benth.) Müll. Arg.	
Fagaceae	*Castanopsis fissa* (Champ. ex Benth.) Rehder et E. H. Wilson	
	Cyclobalanopsis fleuryi (Hickel et A. Camus) Chun ex Q. F. Zheng	
	Lithocarpus glaber (Thunb.) Nakai	
	Lithocarpus macilentus Chun & C.C. Huang	endemic to southern Guangdong & eastern Guangxi
Flacourtiaceae	*Casearia glomerata* Roxb.	
	Flacourtia rukam Zoll. & A. Mortizi	
Gesnariaceae	*Gyrocheilos chorispalum* W.T.Wang var. *synsepalum* W.T.Wang	endemic to western Guangdong & eastern Guangxi
	Lysionotus pauciflorus Maxim.	
Hamamelidaceae	*Rhodoleia championii* Hook. f.	
Lamiaceae	*Mosla scabra* (Thunb.) C.Y. Wu et H. W. Li	
Lardizabalaceae	*Stauntonia chinensis* DC.	
Lauraceae	*Cassytha filiformis* L.	
	Cinnamomum porrectum (Roxb.) Kosterm.	
	Cryptocarya chinensis (Hance) Hemsl.	
	Lindera chunii Merr.	
	Litsea acutivena Hayata	
	Litsea cubeba (Lour.) Pers.	
	Litsea elongata (Nees) Benth. et Hook. f.	
	Machilus chinensis (Champ. ex Benth.) Hemsl.	
	Machilus velutina Champ. ex Benth.	
	Neolitsea chuii Merr.	
Loganiaceae	*Gelsemium elegans* (Gardner et Champ.) Benth.	
Magnoliaceae	*Magnolia paenetalauma* Dandy	
Malvaceae	*Urena lobata* L.	pantropical weed
Melastomataceae	*Barthea barthei* (Hance ex Benth.) Krasser	
	Melastoma candidum D. Don	
	Melastoma sanguineum Sims	
Menispermaceae	*Stephania longa* Lour.	
Mimosaceae	*Albizia corniculata* (Lour.) Druce	
	Pithecellobium clypearia (Jack) Benth.	
Molluginaceae	*Mollugo pentaphylla* L.	
Moraceae	*Ficus hirta* Vahl	
	Ficus vasculosa Wall. ex Miq.	
Myricaceae	*Myrica rubra* (Lour.) Sieb. et Zucc.	
Myrsinaceae	*Ardisia quinquegona* Blume	
	Ardisia villosa Roxb.	
	Myrsine stolonifera (Koidz.) E. Walker	

Family	Scientific name	Remarks
	Myrsine seguinii H. Lév	
Myrtaceae	*Acmena acuminatissima* (Blume) Merr. et L. M. Perry	
	Baeckea frutescens L.	
	Rhodomyrtus tomentosa (Aiton) Hassk.	
	Syzygium kwangtungense (Merr.) Merr. et Perry	
Oleaceae	*Jasminum lanceolarium* Roxb.	
	Ligustrum amamianum Koidz.	
Papilionaceae	*Dalbergia hancei* Benth.	
	Desmodium heterocarpon (L.) DC.	
	Millettia dielsiana Harms	
	Ormosia emarginata (Hook. & Arn.) Benth.	endemic to Guangdong & Hainan
	Pueraria lobata (Willd.) Ohwi	
Piperaceae	*Piper hancei* Maxim.	
Polygonaceae	*Polygonum lapathifolium* L.	
Proteaceae	*Helicia longipetiolata* Merr.& Chun	
	Helicia reticulata W. T. Wang	
Rosaceae	*Laurocerasus phaeosticta* (Hance) C. K. Schneid.	
	Pygeum topengii Merr.	
	Rhaphiolepis lanceolata Hu	only site in Guangdong
Rubiaceae	*Adina pilulifera* (Lam.) Franch. ex Drake	
	Diplospora dubia (Lindl.) Masam.	
	Dunnia sinensis Tutcher	Protected II; endemic to southern Guangdong
	Gardenia jasminoides J. Ellis	
	Gardenia stenophylla Merr.	
	Hedyotis yangchunensis W.C. Ko & Zhang	endemic to Guangdong
	Lasianthus chinensis (Champ. ex Benth.) Benth.	
	Morinda umbellata L.	
	Mussaenda pubescens W. T. Aiton	
	Ophiorrhiza cantoniensis Hance	
	Psychotria asiatica L.	
	Wendlandia uvariifolia Hance	
	Acronychia pedunculata (L.) Miq.	
	Fortunella hindsii (Champ. ex Benth.) Swingle	
Sabiaceae	*Meliosma rigida* Siebold et Zucc.	
Santalaceae	*Dendrotrophe frutescens* (Champ. ex Benth.) Danser	
Sapindaceae	*Nephelium chryseum* Blume	
Sapotaceae	*Sinosideroxylon wightianum* (Hook. & Arn.) Aubrév.	
Sterculiaceae	*Reevesia thyrsoidea* Lindl	
	Sterculia lanceolata Cav.	
Styracaceae	*Alniphyllum fortunei* (Hemsl.) Makino	
Symplocaceae	*Symplocos adenopus* Hance	
	Symplocos lancifolia Siebold & Zucc.	
Theaceae	*Adinandra elegans* F.C. How & Ko ex H.T. Chang	endemic to Yangchun
	Anneslea fragrans Wall. var. *rubriflora* (Hu et H.T. Chang) L.K. Ling	endemic to Yangchun
	Cleyera pachyphylla Chun ex H.T. Chang	
	Eurya macartneyi Champ.	
	Euryodendron excelsum H. T. Chang	near Bajia town; Critically Endangered (IUCN); endemic to Yangchun & Guangxi
	Gordonia axillaris (Roxb. ex Ker Gawl.) Dietr.	
	Schima superba Gardn. et Champ.	
Ulmaceae	*Trema orientalis* (L.) Blume	
Verbenaceae	*Callicarpa formosana* Rolfe (*C. pedunculata* R. Br.)	
	Clerodendrum cyrtophyllum Turcz.	
	Clerodendrum fortunatum L.	
	Clerodendrum japonicum (Thunb.) Sweet	

Family	Scientific name	Remarks
Monocotyledonae		
Araceae	*Acorus gramineus* Sol.	
	Alocasia macrorrhiza (L.) Schott	
	Pothos repens (Lour.) Druce	
Areaceae	*Pinanga discolor* Burret	
Commelinaceae	*Floscopa scandens* Lour.	
Cyperaceae	*Carex cryptostachys* Brongn.	
	Fimbristylis aestivalis (Retz.) Vahl	
	Gahnia tristis Nees	
	Lepidosperma chinensis Nees & Meyen	
Dioscoreaceae	*Dioscorea cirrhosa* Lour.	
Eriocaulaceae	*Eriocaulon sexangulare* L.	
Juncaceae	*Juncus prismatocarpus* R. Br.	
Liliaceae	*Chionographis chinensis* K. Krause	
	Peliosanthes teta Andrews	
	Smilax china L.	
Musaceae	*Orchidantha chinensis* T.L.Wu	endemic to western Guangdong & southern Guangxi
Orchidaceae	*Ania* cf. *hongkongensis* (Rolfe) T. Tang et F.T. Wang	terrestrial
	Anoectochilus roxburghii (Wall.) Lindl.	Vulnerable in China; terrestrial
	Arundina graminifolia (D. Don) Hochr.	terrestrial
	Habenaria sp.	terrestrial
	Liparis sp.	epiphytic
	Paphiopedilum cf. *purpuratum* (Lindl.) Pfitzer	terrestrial
	Pholidota chinensis Lindl.	epiphytic
Pandanaceae	*Pandanus austrosinensis* T. L. Wu	
Poaceae	*Acidosasa chinensis* C.D.Chu et C.S.Chao	endemic to Yangchun
	Ischaemum indicum (Houtt.) Merr.	
	Lophatherum gracile Brongn.	
	Miscanthus floridulus (Labill.) Warb. ex K. Schum et Lauterb.	
	Miscanthus sinensis Andersson	
	Panicum repens L.	
	Thysanolaena maxima (Roxb.) Kuntze	
Zingiberaceae	*Alpinia japonica* (Thunb.) Miq.	
	Alpinia oblongifolia Hayata	
	Alpinia stachyoides Hance	
	Alpinia strobiliformis T. L. Wu et S. J. Chen var. *glabra* T. L. Wu	

Two mature trees of a globally Critically Endangered species, *Euryodendron excelsum*, were visited near Bajia. A third tree had died recently. The species is narrowly and sparsely distributed in western Guangdong and Guangxi, and only a few surviving trees are known (Anon., 1959-2000, Vol. 50(1): 68-70). The orchid *Anoectochilus roxburghii* is Vulnerable in China. Two Class II nationally protected plants were also found: *Cibotium barometz* and *Dunnia sinensis*. The latter is endemic to southern Guangdong. National conservation status of orchids is currently under review, but *Paphiopedilum* cf. *purpuratum* is listed under CITES Appendix I, whereas the other species recorded are listed under CITES Appendix II.

Eight other endemic or narrowly distributed species were found: *Acidosasa chinensis* (endemic to Yangchun only), *Adinandra elegans* (Yangchun only), *Anneslea fragrans* var. *rubriflora* (Yangchun), *Hedyotis yangchunensis* (Guangdong), *Lithocarpus macilentus* (southern Guangdong and eastern Guangxi), *Gyrocheilos chorispalum* var. *synsepalum* (western Guangdong and eastern Guangxi), *Orchidantha chinensis* (western Guangdong & southern Guangxi) and *Ormosia emarginata* (Guangdong and Hainan). Of these, *Adinandra elegans*,

Anneslea fragrans var. *rubriflora*, *Hedyotis yangchunensis*, and *Lithocarpus macilentus* were locally common or dominant species in the vegetation.

Mammals

No direct records were made. A single pile of scats was found on 5 May; these were possibly produced by Chinese Ferret-badger *Melogale moschata*.

Table 2. The status of mammals (excluding Erinaceidae, Talpidae, Soricidae, Muridae and Chiroptera) at Heweishan, Guangdong. Based on an interview with forest farm warden Mr. Huang. Sequence follows D.E. Wilson & Cole (2000); synonyms commonly used by Chinese scientists are included in brackets. (+ = "rare", ++ = "common", +++ = "abundant")

Scientific name	English name	Mr. Huang	Probable status
Tupaia belangeri	Northern Tree Shrew	+	uncertain
Melogale moschata	Chinese Ferret-badger	+	present
Paguma larvata	Masked Palm Civet	+	insecure
Sus scrofa	Wild Boar	+++	present
Muntiacus muntjak	Indian Muntjac	+	insecure
Muntiacus reevesi	Reeves's Muntjac	+	uncertain
Manis pentadactyla	Chinese Pangolin	+	insecure
Tamiops maritimus (T. swinhoei)	Maritime Striped Squirrel	+	present

Results from interviewing a single person must be treated with caution, but it would appear that the mammal fauna was highly impoverished. The reported presence of Northern Tree Shrew *Tupaia belangeri* is of interest, since within Guangdong it is believed to be confined to the Leizhou Peninsula (Yuan Xicai, South China Institute of Endangered Animals, pers. comm. April 1997). Identification of the muntjacs is uncertain; the report of Reeves's Muntjac *Muntiacus reevesi* is also questionable because it is thought to be absent from southern Guangdong (Yuan Xicai, South China Institute of Endangered Animals, pers. comm. April 1997).

Chinese Pangolin *Manis pentadactyla* is a globally Lower Risk (Near-threatened) species, and Class II protected in China.

Birds

A total of 28 species was recorded (Table 3). The most frequently found species in Bajia Xianhu was Rufous-capped Babbler *Stachyris ruficeps*. Most frequent at Heweishan were Sulphur-breasted Warbler *Phylloscopus ricketti*, Large Hawk Cuckoo *Hierococcyx sparverioides*, Bay Woodpecker *Blythipicus pyrrhotis* and Pygmy Wren Babbler *Pnoepyga pusilla*.

Table 3. Birds recorded at Heweishan, 4-5 May 1998. Sequence follows Clements (2000).

Scientific name	English name
Milvus migrans	Black Kite
Spilornis cheela	Crested Serpent Eagle
Falco tinnunculus	Common Kestrel
Hierococcyx sparverioides	Large Hawk Cuckoo
Eurystomus orientalis	Dollarbird
Megalaima virens	Great Barbet
Blythipicus pyrrhotis	Bay Woodpecker
Motacilla alba	White Wagtail
Pycnonotus jocosus	Red-whiskered Bulbul
Hemixos castanonotus	Chestnut Bulbul
Myophonus caeruleus	Blue Whistling Thrush
Prinia atrogularis	Hill Prinia
Prinia flaviventris	Yellow-bellied Prinia
Cettia fortipes	Brownish-flanked Bush Warbler
Orthotomus cuculatus	Mountain Tailorbird

Scientific name	English name
Orthotomus sutorius	Common Tailorbird
Phylloscopus ricketti	Sulphur-breasted Warbler
Cyornis hainanus	Hainan Blue Flycatcher
Garrulax chinensis	Black-throated Laughingthrush
Garrulax canorus	Hwamei
Pomatorhinus erythrocnemis	Spot-breasted Scimitar Babbler
Pomatorhinus ruficollis	Streak-breasted Scimitar Babbler
Pnoepyga pusilla	Pygmy Wren Babbler
Stachyris ruficeps	Rufous-capped Babbler
Aethopyga christinae	Fork-tailed Sunbird
Dicaeum ignipectus	Fire-breasted Flowerpecker
Urocissa erythrorhyncha	Red-billed Blue Magpie
Corvus macrorhynchos	Large-billed Crow

Black Kite *Milvus migrans*, Crested Serpent Eagle *Spilornis cheela* and Common Kestrel *Falco tinnunculus* are Class II protected species in China. The presence of a variety of forest species (e.g. Bay Woodpecker *Blythipicus pyrrhotis*, Great Barbet *Megalaima virens*, Chestnut Bulbul *Hemixos castanonotus* and several babblers) suggests that there is more mature forest within the vicinity.

Reptiles and Amphibians

Twelve species of amphibian and reptile were found at Heweishan and five species were recorded around Bajia (Table 4). The most abundant species at Heweishan was *Rana taipehensis*. *Occidozyga lima* was the most frequently encountered species near Bajia.

Table 4. Amphibians and reptiles recorded at Heweishan and Bajia, 4-5 May 1998. Sequence follows Zhao E.-M. & Adler (1993).

Species	Habitat	Records
Ophryophryne pachyproctus?	stream	✓
Bufo melanostictus	grassland	✓
Occidozyga lima	paddy field	✓
Rana guentheri	pool	✓
	paddy field	✓
	marsh/pool	eggs, tadpoles
	grassland	✓
Rana livida	stream	✓
Rana spinosa ?	stream	tadpole
Rana taipehensis	grassland	✓
	marsh/pool	✓
Polypedates megacephalus	pool	eggs, tadpoles
Microhyla ornata	grassland	✓
Hemidactylus bowringi	village	✓
Calotes versicolor	village	✓
Sphenomorphus incognitus	stream	✓
Achalinus rufescens	shrubland	✓
Amphiesma stolatum	ag. field	✓
Psammodynastes pulverulentus	shrubland	✓
Rhabdophis subminiatus	pool	✓

The skink *Sphenomorphus incognitus*, which had not been recorded from Guangdong before this survey trip (Kadoorie Farm and Botanic Garden, 2002a, 2002b), was found at Heweishan during this survey as well as at Qixingkeng and Baiyong. Mating calls of an anuran, most likely to be *Ophryophryne pachyproctus*, were also heard near the small streams at Heweishan. *Ophryophryne pachyproctus* was apparently known only from its type locality at Zhushihe, Yunnan (Zhao E.-M. & Adler, 1993) before being found at Baiyong (Kadoorie Farm and Botanic Garden, 2002b) in this survey trip.

Fish

Eight species of freshwater fish were recorded from Bajia and Heweishan (Table 5). Some specimens await specialist verification. The most frequently encountered were *Parazacco spilurus spilurus*, *Nicholsicypris normalis*, *Carassius auratus* and *Rhinogobius giurinus*.

Table 5. Freshwater fish species at Bajia and Heweishan, 4-5 May 1998. Sequence follows Nelson (1994).

Species	**Habitat**
Parazacco spilurus spilurus	stream
Nicholsicypris normalis	stream
Pseudorasbora parva	reservoir
Carassius auratus	stream
Oryzias sp.	?
Monopterus albus	?
Rhinogobius giurinus	stream
Channa asiatica	where stream enters reservoir

The specimens of *Oryzias* sp. need to be verified by a specialist, and the species could be of conservation significance. Overall, the site was not exceptional in terms of species richness or the rarity of the species recorded.

Ants

Nineteen ant species were recorded from Heweishan (Table 6). The most frequently encountered species were *Pheidole* sp. 1, *Crematogaster* sp. 8 and *Paratrechina* sp. 4.

Table 6. Ant species recorded at Heweishan and Bajia, 4-5 May 1998.

Species	**Habitat**
Aenictus (*laeviceps* group) sp. 2	low shrubland, grassland
Camponotus (cf. *jianghuaensis*) sp. 15	forest/grassland
Camponotus rufoglaucus	farmland
Camponotus sp. 28	low shrubland
Crematogaster (cf. *dohrni*) sp. 8	low shrubland
Leptogenys kitteli	low shrubland
Monomorium chinense	farmland
Pachycondyla (*javana* group) sp. 1	shrubland
Pachycondyla (cf. *luteipes*) sp. 2	shrubland, grassland
Paratrechina (cf. *bourbonica*) sp. 4	shrubland, grassland
Pheidole (cf. *noda*) sp. 1	low shrubland, grassland
Pheidole (cf. *yeensis*) sp. 40	farmland
Pheidologeton affinis	low shrubland
Polyrhachis demangei	farmland
Polyrhachis dives	grassland
Polyrhachis halidayi	low forest
Polyrhachis tyrannica	bamboo, grassland
Prenolepis (cf. *emmae*) sp. 1	low forest
Pristomyrmex pungens	grassland
Tapinoma sp. 1	low shrubland
Technomyrmex albosparsus	shrubland, farmland
Tetraponera binghami	bamboo, low forest

None of the ant species found are believed to be new to science or to Guangdong Province, and none are very rare or restricted.

Dragonflies

Sixteen species of dragonfly were encountered over the two-day period (Table 7). The most frequently encountered was the ubiquitous *Pantala flavescens*.

Table 7. Dragonflies recorded at Heweishan, 4-5 May 1998. Sequence of families follows Schorr *et al.* (2001a; 2001b).

Species	Habitat (~550m)	Notes
Neurobasis chinensis	grassland stream	
Euphaea decorata	grassland stream	
Copera ciliata	marsh	
Anax guttatus	marsh/pond	
Macromia sp. A	riparian forest	not collected
Macromia sp. B	riparian forest	not collected
Gomphinae sp. A	grassland stream	pending identification
Paragomphus capricornis	grassland stream	new record for Guangdong
Acisoma panorpoides	marsh/pond	
Crocothemis servilia	marsh/pond	
Orthetrum glaucum	grassland/marsh	
Orthetrum pruinosum	grassland stream	
Palpopleura sexmaculata	marsh/pond	
Pantala flavescens	ubiquitous	
Trithemis aurora	marsh/pond	
Trithemis festiva	grassland stream	

Unfortunately, apart from a species of Gomphinae awaiting identification, the most interesting dragonflies observed were two species of *Macromia* which could not be collected or identified in the field. The remaining thirteen species are all also known from Hong Kong, where (with the exception of the rare *Paragomphus capricornis*) they are all abundant to fairly common (K.D.P. Wilson, 1997). *P. capricornis* has not previously been recorded from Chinese territory outside of Hong Kong (K.D.P. Wilson, 1997), and is therefore a new provincial record.

Butterflies

Twenty-five butterfly species were recorded (Table 8). By far the most abundant butterfly recorded during this survey was the blue-spotted crow *Euploea midamus*, of which more than 100 individuals were encountered. Of the 24 other species recorded, 22 are also known from Hong Kong. No new provincial records were made and the butterfly fauna was typical for disturbed habitats in southern Guangdong.

Table 8. Butterflies recorded at Heweishan, 4-5 May 1998. Sequence of families follows Bascombe (1995).

Species	Habitat (~550m)
Parnara guttatus	grassland/marsh
Papilio helenus	grassland/marsh
Papilio paris	disturbed forest, grassland
Troides helena	grassland/marsh
Dercas verhuelli	grassland/marsh
Eurema laeta	grassland/marsh
Pieris (Artogeia) canidia	disturbed forest
Abisara echerius	disturbed forest
Nacaduba kurava	disturbed forest
Zemeros flegyas	disturbed forest
Argyreus hyperbius	disturbed forest
Cupha erymanthis	grassland/ marsh
Cyrestis thyodamas	grassland/ marsh
Danaus genutia	disturbed forest
Euploea core	grassland/marsh
Euploea midamus	disturbed forest, grassland/marsh
Melanitis leda	disturbed forest, grassland/ marsh
Mycalesis gotama	disturbed forest
Mycalesis panthaka	grassland/marsh
Parantica aglea	disturbed forest
Parantica melaneus	grassland/marsh
Polygonia (Kaniska) canace	disturbed forest
Polyura athamas	grassland/marsh

Species	Habitat (~550m)
Tirumala limniace	grassland/marsh
Vanessa indica	grassland/marsh

Rove Beetles

Four species of staphylinid beetles were recorded at Heweishan (Table 9). Three of these (*Erichsonius* sp., *Nazeris* sp. and *Paratachinus* sp.) are new to science; of these the first was also recorded at Baiyong (Kadoorie Farm and Botanic Garden, 2002b).

Table 9. Rove beetles (Staphylinidae) recorded at Heweishan, 4-5 May 1998.

Species	Habitat	Notes
Erichsonius sp. nov.	tall shrubland litter	also at Baiyong
Nazeris sp. nov.	tall shrubland litter	
Paratachinus sp. nov.	tall shrubland litter	
Stenus melanarius annamita Fv.	grassland	widespread in China & S. Asia

Summary of flora and fauna

Due to the very limited time input and the bad weather, this survey did not give a representative picture of the area since the survey team was unable to reach the forest habitat. Heweishan has quite extensive and mature evergreen broadleaf forest at higher altitude, although the lower slopes were deforested. The flora is rather rich, with 188 vascular plant species recorded in one and a half days of survey. Although only two nationally protected plants and one nationally vulnerable orchid were found, the area supports a number of species which are restricted to the western Guangdong and eastern Guangxi region. One Critically Endangered tree species, *Euryodendron excelsum*, occurred at nearby Bajia.

The presence of Bay Woodpecker indicated that fairly mature forest occurred deeper in the site. The streams are probably of ecological interest (as indicated by the presence of the dragonfly *Paragomphus capricornis* - a new Guangdong record), and may support the rare frog *Ophryophryne pachyproctus.* Thus the site is likely to be of high local conservation importance.

Threats and problems

Hydroelectric plants and the reservoir in the area have drastically altered the streams in the lower reaches. Lower slopes of the hills have been deforested and the vegetation is not well established. The degraded and fragmented vegetation leaves threatened species, such as *Euryodendron excelsum*, at severe risk of extinction. Over-collection of the orchid *Anoectochilus roxburghii* for medicinal and ornamental use is the main threat to the survival of the wild populations in both nature reserves and unprotected areas in south and southwest China.

Opportunities and recommendations

The Yangchun authorities recognise the economic importance of natural forest at Heweishan, and the need to protect it. Their effort was rewarded when Ehuangzhang County-level Nature Reserve was establsihment in 2001. Restoration of natural forest would also be expected to provide economic benefits. Natural succession should lead to good secondary forest, as has happened on similar hillsides of Hong Kong. The need to assist this natural regeneration, with planting of important native species, should be considered.

With the establshement of Ehuangzhang Nature Reserves, the reserve staff will need a clear understanding of the conservation objectives, which should include the protection of key habitats

from logging, hunting, fishing, plant collecting and other incompatible activities. We recommend the area be zoned and managed with the aim to protect important ecosystems, and to restore more degraded areas. A fuller inventory of the fauna and flora should be prepared, particularly at higher elevations where vegetation is relatively mature. Some monitoring of ecosystem integrity would also be valuable.

Although one of the three mature *Euryodendron excelsum* trees at Bajia mentioned in Anon. (1959-2000, Vol. 50(1)) had recently died, saplings and small trees have been found in the agricultural landscape nearby (Zhuang Xue-Ying, South China Agricultural University, pers. comm. August 2001). This suggests the species has the potential to recover in surrounding farmland and hillsides. Extensive surveys for this species should be carried out as soon as possible in nearby hillsides during the flowering season, to look for new populations and adult trees. Although the local villagers seem to have sufficient knowledge of the importance of the two large trees, there is an urgent need to carry out ex-situ conservation and protect the existing population through the local forestry department to reduce its extinction risk. Appropriate measures include seed collection and long-term storage, and production of saplings from seeds or cuttings. Its habitat requirements, if possible, should also be determined so that suitable sites can be identified for future planting. Research into the causes of its rarity, although less urgent, may be essential for long-term survival of the species.

Further development of the Nature Reserve should include a programme of public awareness, and the building of incentives among local residents for conservation. This will call for capacity building among staff, to ensure they have a broad understanding of the ecological significance of the site, and good motivation to achieve conservation objectives.

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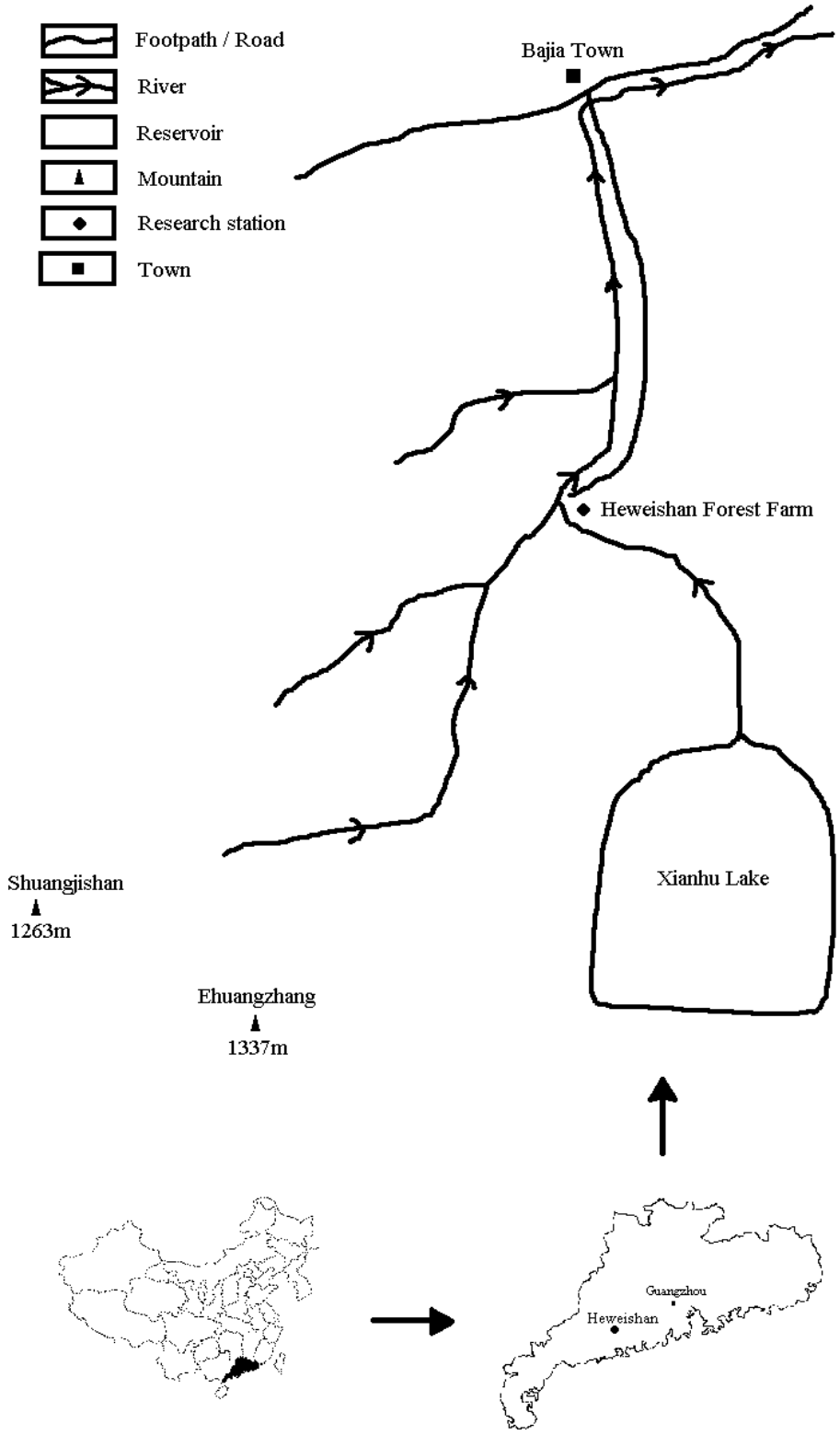

Figure 1 Heweishan Forest Farm, Southwest Guangdong