



**Report of a Rapid Biodiversity Assessment at
Nanweiling Forest Area, Central Hainan,
1 to 2 April 1998**

Kadoorie Farm & Botanic Garden
in collaboration with
**Hainan Province Forestry Bureau and
South China Institute of Endangered Animals**

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Report of a Rapid Biodiversity Assessment at Nanweiling Forest Area, Central Hainan, 1 to 2 April 1998

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Background

The present report details the findings of a brief trip to central Hainan by members of Kadoorie Farm & Botanic Garden (KFBG) in Hong Kong and their colleagues, as part of KFBG's South China Biodiversity Conservation Programme, launched in February 1998. The overall aim of the programme is to minimize 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.

Note on Style

Kadoorie Farm and Botanic Garden currently follows styles recommended by *Scientific Style and Format: the CBE Manual for Authors, Editors, and Publishers*, 4th ed., and *The Chicago Manual of Style*, 14th ed.

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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
Lake	hu
Sea	hai
Harbour	gang
Bay	wan
Outlet	kou
City	shi
County	xian
Village	xiang, cun
Hamlet	tun
The Chinese system of geomancy	feng shui

Report of a Rapid Biodiversity Assessment at Nanweiling Forest Area, Central Hainan, 1 to 2 April 1998

Objectives

The secondary woodland at Nanweiling Forest Area, Tunchang County is reported to harbour three bird species of special interest: Hainan Partridge (*Arborophila ardens*), Hainan Peacock Pheasant (*Polyplectron katsumatae*) and Silver Pheasant (*Lophura nycthemera whiteheadi*). According to Professor Gao Yuren (GYR) of South China Institute of Endangered Animals, local Forestry Bureau officials wished to designate Nanweiling Forest Area as a Provincial Nature Reserve. Thus, a small KFBG team visited the area for a preliminary assessment of its biodiversity importance.

Methods

On 1 April the KFBG team (LC, JRF, GYR, BH, LKS) with Mr. Hu Zhaoyong, Deputy Director of Tunchang Forestry Bureau, and a forest warden conducted a rapid survey at the Nanweiling Forest Area (Figure 1). All species identified were recorded. Recordings of the calls of Hainan Partridge and Hainan Peacock Pheasant were played to elicit the calls of wild birds. The altitude of the woodland visited was 300 to 400 m.

Estimates of the status of mammals (excluding Erinaceidae, Talpidae, Soricidae, Muridae and Chiroptera) at Nanweiling Forest Area were based on interviews with staff, farmers and hunters of the area using colour pictures. For purposes of these interviews, a list of South China mammals was compiled from various sources including Anon. (1983, 1987), Zeng et al. (1995), Corbet and Hill (1992) and Zhang et al. (1997).

Bird records in the survey were made by LKS and GYR, and verified by LKS. Reptile and amphibian records were made by JRF and BH, and verified by ML. Ant records were made and verified by JRF. Scientific nomenclature in the report is standardised based, unless otherwise stated, on the following references:

- Mammals (Mammalia): Wilson and Reeder (1993);
- Birds (Aves): Inskipp et al. (1996);
- Reptiles & amphibians (Reptilia and Amphibia): Zhao and Adler (1993);
- Ants (Insecta: Hymenoptera: Formicidae): named species according to Bolton (1995); unnamed species with reference numbers according to the collection currently held by KFBG.

Information on the global status of species is from IUCN publications, notably Hilton-Taylor (2000). Protected status of animals in China is based on Anon. (1993).

Location and management

The Nanweiling Forest Area is located at 19° 30' E and 109° 56' N, along the eastern bank of the middle section of Nanduijiang, which flows north to Haikou (Figure 1). The forest area is about 6 km long (north-south) and 4 km wide (east-west). The total area is 1,103 ha of which 1,092 ha are covered in spontaneous tropical broadleaf secondary forests. According to local forestry bureau officials the highest point of Nanweiling area is 756 m. Because of its role as a catchment for Nanduijiang, the largest river in Hainan, the Nanweiling Forest Area has been protected from logging since 1987. Local forestry bureau officials were hoping to upgrade this protected status to make Nanweiling Forest Area a Provincial nature reserve.

Results

Vegetation

The part of the forest we visited was typical secondary forest. The species composition is similar to those secondary forests in Hong Kong. Dominant species included *Schima superba*, *Castanopsis fissa*, *Schefflera octophylla*, *Sapium discolor*, *Cratoxylum lingustrinum*, *Mallotus paniculatus* etc. Trees were small, the largest not exceeding 15cm dbh. The average size was around 10cm dbh.

Mammals

No direct mammal records were made at Nanweiling. However, a *Tamiops maritimus* (striped squirrel) was seen in the morning of 2 April near Haikou.

One local farmer and a forestry warden were interviewed about the status of mammals in Nanweiling Forest Area using colour pictures (Table 1). The interviewees were shown a set of unlabelled photographs of South China mammals and were asked if the species illustrated were present, and if so, whether common or rare. South China species not reported at Nanweiling Forest Area are omitted from Table 1.

Table 1 The status of mammals (excluding Erinaceidae, Talpidae, Soricidae, Muridae and Chiroptera) at Nanweiling Forest Area, Tunchang County, Hainan based on interviewing forestry warden Mr. Pan Degui and a local farmer. Scientific names follow Wilson and Reeder (1993), synonyms and names commonly used by Chinese scientists are included in brackets. (+ = "rare", ++ = "common").

Scientific name	English name	Warden	Farmer	Probable status
<i>Tupaia belangeri</i>	Northern tree shrew	–	++	present
<i>Macaca mulatta</i>	Rhesus macaque	+	–	rare
<i>Manis pentadactyla</i>	Chinese pangolin	+	+	rare
<i>Vulpes vulpes</i>	Red fox	–	+	rare
<i>Nyctereutes procyonoides</i>	Raccoon dog	–	+	rare
<i>Ursus thibetanus</i>	Asiatic black bear	1 found in 85/86	–	locally extinct
<i>Melogale moschata</i>	Ferret badger	–	+	rare
<i>Lutra lutra</i>	Eurasian otter	–	+	rare
<i>Viverricula indica</i>	Small Indian civet	–	++	rare
<i>Prionodon pardicolor</i>	Spotted linsang	+ in local market	+	rare
<i>Tamiops maritimus</i> (<i>T. swinhoei hainanus</i>)	Striped squirrel	++	++	quite common
<i>Hystrix brachyura</i> (<i>H. hodgsoni</i>)	Chinese porcupine	++	+	quite common
<i>Sus scrofa</i>	Wild boar	++	+	quite common
<i>Muntiacus muntjak</i>	Indian muntjac	+ in local market	–	rare

The Hainan status of *Vulpes vulpes* (red fox), *Nyctereutes procyonoides* (raccoon dog) and *Prionodon pardicolor* (spotted linsang) is not certain. Field surveys would be necessary to confirm these reports.

Lutra lutra (Eurasian otter) is globally Vulnerable, and a Class II protected species in China. *Hystrix brachyura* (Chinese porcupine) is globally Vulnerable. *Macaca mulatta* (rhesus macaque) and *Manis pentadactyla* (Chinese pangolin) are considered Lower Risk (Near-threatened) globally, and Class II protected in China. *Viverricula indica* (small Indian civet) and spotted linsang are Class II-protected species in China.

Birds

In the April survey, 37 bird species were recorded from Nanweiling and 21 species from Hongdoubo (Table 2). The most frequently recorded species at Nanweiling were *Pycnonotus sinensis* (Light-vented Bulbul), *Ardeola bacchus* (Chinese Pond Heron), *Hemixos castanonotus* (Chestnut Bulbul), *Centropus sinensis* (Greater Coucal), *Alcippe morrisonia*

(Grey-cheeked Fulvetta), *Zosterops japonicus* (Japanese White-eye) and *Hirundo rustica* (Barn Swallow). The most abundant species around the Hongdoubu egretty were *Bubulcus ibis* (Cattle Egret), Chinese Pond Heron, *Phylloscopus inornatus* (Yellow-browed Warbler), Barn Swallow, *Egretta garzetta* (Little Egret) and *Anthus hodgsoni* (Olive-backed Pipit).

All of the species recorded have previously been recorded from Hainan (e.g. Cheng, 1987; Yan et al., 1995). The Hongdoubu egretty is an important breeding site for Cattle Egret.

Polyplectron katsumatae (Hainan Peacock Pheasant) and *Lophura nycthemera whiteheadi* (Silver Pheasant), a subspecies endemic to the island, have previously been recorded at Nanweiling (Gao, 1998a; Gao and Yu, 1995), and local Forestry Bureau officials also reported the occurrence of *Arborophila ardens* (Hainan Partridge). According to local forestry officials the Hainan Peacock Pheasant and Hainan Partridge move down the slopes during dry weather; this may explain why they were not recorded during this visit. In October and November, when there is reportedly more rainfall locally, the birds move back up the slopes, and are more likely to be heard at Nanweiling (Gao, 1997; 1998b). Between 1987 and 1994 the presence of Hainan Partridge was confirmed at three sites in Hainan, and reported from four others (Gao, 1998a). Hainan Peacock Pheasant has been confirmed at five sites and reported from four others (Gao, 1998a). Silver Pheasant has been confirmed at six sites and reported from most parts of Hainan where suitable forest remains (Gao, 1998a).

To supplement this brief survey, a survey of the galliform birds at Nanweiling was conducted in November 1998, by GYR and Yu Dequn of the South China Institute of Endangered Animals. This confirmed the presence of the three endemic galliform taxa at Nanweiling, although in lower numbers than previously recorded (Gao and Yu, 1999). The population estimates from this survey were 23 to 32 Silver Pheasant, 11 to 16 Hainan Peacock Pheasant, 17 to 24 Hainan Partridge and 6 to 8 *Gallus gallus* (Red Jungle Fowl). In addition to these four species, Gao and Yu recorded 34 other bird species at Nanweiling in November 1998 (Table 3).

Hainan Partridge is globally Vulnerable, and nationally protected (Category II) in China. *Phylloscopus hainanus* (Hainan Leaf Warbler) is globally Vulnerable. *Milvus migrans* (Black Kite), *Spilornis cheela* (Crested Serpent Eagle), *Circus aeruginosus* (Eurasian Marsh Harrier), *Accipiter trivirgatus* (Crested Goshawk), *Accipiter badius* (Shikra), *Spizaetus nipalensis* (Mountain Hawk Eagle), Silver Pheasant, Red Jungle Fowl, Hainan Peacock Pheasant, Greater Coucal and *Otus bakkamoena* (Collared Scops Owl) are Class II-protected species in China. Eurasian Marsh Harrier, *Picus flavinucha* (Greater Yellownap), *Pericrocotus divaricatus* (Ashy Minivet), *Copsychus malabaricus* (White-rumped Shama), *Zoothera citrina* (Orange-headed Thrush), *Garrulax monileger* (Lesser Necklaced Laughingthrush) and *Cissa hypoleuca* (Indochinese Green Magpie) are of regional interest, since these species are rarely recorded from the mainland coastal tropics of South China. *Harpactes erythrocephalus* (Red-headed Trogon), *Megalaima oorti* (Black-browed Barbet) and Greater Yellownap are characteristic of primary or mature secondary forests. The high abundance of *Hemixos castanonotus* (Chestnut Bulbul) and *Alcippe morrisonia* (Grey-cheeked Fulvetta) are also indicative of fairly mature forest.

Table 2 Bird species recorded at Nanweiling and Hongdoubu Village on 1 and 2 April 1998. Sequence follows Clements (2000). (F=feather found)

Scientific name	Common name	Nanweiling Forest Area
<i>Egretta garzetta</i>	Little Egret	✓
<i>Ardeola bacchus</i>	Chinese Pond Heron	✓
<i>Bubulcus ibis</i>	Cattle Egret	✓
<i>Circus aeruginosus</i>	Eurasian Marsh Harrier	
<i>Spizaetus nipalensis</i>	Mountain Hawk Eagle	✓

Scientific name	Common name	Nanweiling Forest Area
<i>Glareola maldivarum</i>	Oriental Pratincole	✓
<i>Actitis hypoleucos</i>	Common Sandpiper	✓
<i>Streptopelia orientalis</i>	Oriental Turtle Dove	✓
<i>Chalcophaps indica</i>	Emerald Dove	✓
<i>Clamator coromandus</i>	Chestnut-winged Cuckoo	✓
<i>Hierococcyx sparverioides</i>	Large Hawk Cuckoo	✓
<i>Cuculus micropterus</i>	Indian Cuckoo	✓
<i>Cacomantis merulinus</i>	Plaintive Cuckoo	✓
<i>Eudynamis scolopacea</i>	Asian Koel	✓
<i>Phaenicophaeus tristis</i>	Green-billed Malkoha	F
<i>Centropus sinensis</i>	Greater Coucal	✓
<i>Megalaima oorti</i>	Black-browed Barbet	✓
<i>Harpactes erythrocephalus</i>	Red-headed Trogon	✓, F
<i>Alcedo atthis</i>	Common Kingfisher	✓
<i>Halcyon smyrnensis</i>	White-throated Kingfisher	✓
<i>Halcyon pileata</i>	Black-capped Kingfisher	✓
<i>Picus flavinucha</i>	Greater Yellownape	✓
<i>Hirundo rustica</i>	Barn Swallow	✓
<i>Motacilla alba</i>	White Wagtail	✓
<i>Anthus hodgsoni</i>	Olive-backed Pipit	✓
<i>Pericrocotus flammeus</i>	Scarlet minivet	F
<i>Pycnonotus sinensis</i>	Light-vented Bulbul	✓
<i>Alophoixus pallidus</i>	Puff-throated Bulbul	✓
<i>Hemixos castanonotus</i>	Chestnut Bulbul	✓
<i>Hypsipetes macclllandii</i>	Mountain Bulbul	F
<i>Chloropsis hardwickii</i>	Orange-bellied Leafbird	✓
<i>Turdus merula</i>	Eurasian Blackbird	✓
<i>Phylloscopus inornatus</i>	Yellow-browed Warbler	✓
<i>Muscicapa dauurica</i>	Asian Brown Flycatcher	✓
<i>Copsychus saularis</i>	Magpie Robin	✓
<i>Copsychus malabaricus</i>	White-rumped Shama	✓
<i>Saxicola torquata</i>	Common Stonechat	✓
<i>Garrulax canorus</i>	Hwamei	✓
<i>Pomatorhinus hypoleucos</i>	Large Scimitar Babbler	✓
<i>Stachyris ruficeps</i>	Rufous-capped Babbler	✓
<i>Alcippe morrisonia</i>	Grey-cheeked Fulvetta	✓
<i>Aethopyga christinae</i>	Fork-tailed Sunbird	✓
<i>Dicaeum ignipectus</i>	Fire-breasted Flowerpecker	✓
<i>Zosterops japonicus</i>	Japanese White-Eye	✓
<i>Lanius schach</i>	Long-tailed Shrike	✓
<i>Acridotheres cristatellus</i>	Crested Myna	✓
<i>Lonchura striata</i>	White-rumped Munia	✓

Table 3 Bird species recorded by Gao and Yu (1999) at Nanweiling, Hainan in November 1998. Sequence follows Clements (2000).

Scientific name	Common name
<i>Ardea cinerea</i>	Grey Heron
<i>Milvus migrans</i>	Black Kite
<i>Spilornis cheela</i>	Crested Serpent eagle
<i>Accipiter badius</i>	Shikra
<i>Accipiter trivirgatus</i>	Crested Goshawk
<i>Arborophila ardens</i>	Hainan Partridge
<i>Gallus gallus</i>	Red Jungle Fowl
<i>Lophura nycthemera whiteheadi</i>	Silver Pheasant

Scientific name	Common name
<i>Polyplectron katsumatae</i>	Hainan Peacock Pheasant
<i>Amaurornis phoenicurus</i>	White-breasted Waterhen
<i>Phaenicophaeus tristis</i>	Green-billed Malkoha
<i>Otus bakkamoena</i>	Collared Scops Owl
<i>Apus affinis</i>	House Swift
<i>Blythipicus pyrrhotis</i>	Bay Woodpecker
<i>Motacilla cinerea</i>	Grey Wagtail
<i>Pericrocotus divaricatus</i>	Ashy Minivet
<i>Pericrocotus flammeus</i>	Scarlet Minivet
<i>Hypsipetes mcclllandii</i>	Mountain Bulbul
<i>Zoothera citrina</i>	Orange-headed Thrush
<i>Phylloscopus hainanus</i>	Hainan Leaf Warbler
<i>Cyornis hainanus</i>	Hainan Blue Flycatcher
<i>Cyornis unicolor</i>	Pale Blue Flycatcher
<i>Enicurus leschenaulti</i>	White-crowned Forktail
<i>Hypothymis azurea</i>	Black-naped Monarch
<i>Garrulax monileger</i>	Lesser Necklaced Laughingthrush
<i>Garrulax pectoralis</i>	Greater Necklaced Laughingthrush
<i>Garrulax maesi</i>	Grey Laughing Thrush
<i>Garrulax chinensis</i>	Black-throated Laughingthrush
<i>Pomatorhinus ruficollis</i>	Streak-breasted Scimitar Babbler
<i>Alcippe brunnea</i>	Dusky Fulvetta
<i>Yuhina zantholeuca</i>	White-bellied Yuhina
<i>Dicaeum concolor</i>	Plain Flowerpecker
<i>Dicaeum cruentatum</i>	Scarlet-backed Flowerpecker
<i>Dicrurus macrocercus</i>	Black Drongo
<i>Dicrurus aeneus</i>	Bronzed Drongo
<i>Cissa hypoleuca</i>	Indochinese Green Magpie
<i>Dendrocitta formosae</i>	Grey Treepie
<i>Lonchura punctulata</i>	Scaly-breasted Munia

Reptiles and Amphibians

A recently killed *Amphiesma stolatum* (buff-striped keelback) was seen in the rubber plantation at Nanweiling. Several *Draco maculatus* (flying lizard) were seen in both the rubber plantation and the secondary woodland at Nanweiling. Three frog species - *Microhyla pulchra* (marbled pygmy frog), *Bufo melanostictus* (Asiatic common toad), and *Rana limnocharis* (paddy frog) - were found in the rubber plantation. None of the species recorded are rare or highly restricted globally, although *D. maculatus* is restricted within South China to more tropical southern areas.

Ants

Sixteen ant species were recorded at Nanweiling, of which the most frequently recorded were *Anoplolepis gracilipes* and *Odontoponera* (cf. *denticulata*) sp. 1 (Table 4). None of the species recorded are believed to be new to science. At least one species, *Polyrhachis wolffi*, is a new record for Hainan. None are believed to be rare or highly restricted. *Solenopsis geminata* is an invasive species from South America, while *A. gracilipes* may originate in Africa.

Table 4 Ants: number of encounters at Nanweiling Forest Area, 1-2 April 1998.

Species	Habitat
<i>Aenictus</i> (<i>laeviceps</i> group) sp. 2	Rubber plantation
<i>Anoplolepis gracilipes</i>	Rubber plantation
<i>Camponotus rufoglaucus</i>	Open shrubland, rubber plantation
<i>Cardiocondyla</i> sp. 2	Rubber plantation
<i>Crematogaster</i> (cf. <i>dohrni</i>) sp. 8	Rubber plantation, secondary forest
<i>Crematogaster</i> sp.	Rubber plantation, secondary forest
<i>Diacamma</i> (nr. <i>rugosum</i>) sp. 1	Open shrubland, rubber plantation
<i>Lepisiota rothneyi</i>	Open shrubland, rubber plantation
<i>Leptogenys kitteli</i>	Secondary forest

Species	Habitat
<i>Odontoponera</i> (cf. <i>denticulata</i>) sp. 1	Open shrubland, rubber plantation
<i>Pheidole</i> (cf. <i>yeensis</i>) sp. 40	Rubber plantation
<i>Pheidole</i> (cf. <i>noda</i>) sp. 1	Rubber plantation
<i>Polyrhachis wolffi</i>	Secondary forest
<i>Pristomyrmex pungens</i>	Rubber plantation
<i>Solenopsis geminata</i>	Open shrubland
<i>Tapinoma</i> sp. 1	Open shrubland, secondary forest
<i>Tetraponera attenuata</i>	Rubber plantation, secondary forest

An additional widespread species, *Pachycondyla* (cf. *luteipes*) sp. 2, was recorded in the fung shui wood at Hongduobo Village.

Summary of flora and fauna

The key importance of the Nanweiling site is as a refuge for the threatened Hainan endemic bird taxa, Hainan Partridge and Hainan Peacock Pheasant. Other regionally rare birds, such as Greater Yellownappe, *Alophoixus pallidus* (Puff-throated Bulbul), *Pomatorhinus hypoleucos* (Large Scimitar Babbler) and White-rumped shama, and reptiles such as *D. maculatus*, occurred in the woodlands of the area. These species are more typical of Southeast Asia than of South China, and are near the edge of their range at Tunchang. While the forest is secondary, certain birds, such as Red-headed Trogon and Black-browed Barbet, are typically associated with more mature forests, and may have recolonised from older forests nearby. Various mammals of regional concern, such as *L. lutra*, *H. brachyura* and *M. pentadactyla*, were reported to be present. If confirmed, these species would add to the conservation importance of Nanweiling.

Hongdoubu fung shui wood is a particularly large breeding site for Cattle Egret, which is threatened in southern China by hunting. Protection of this site confers protection on other species that use the egretty in lower numbers.

Threats and problems

Hunting was not severe at Nanweiling, and logging was reported to have stopped. However, the site had no official protection, and the two threatened endemic birds (Hainan Partridge and Hainan Peacock Pheasant) must be considered vulnerable. Gao and Yu (1999) reported that the northern part of the forest had been illegally cleared during 1997, destroying over 250 ha of forest. This clearance was halted, but the threat of further damage remains.

Opportunities and recommendations

The officials of the Tunchang Forestry Bureau demonstrated a clear commitment to protecting the two sites visited. It is hoped that the information from this preliminary survey will serve to support their efforts to protect Nanweiling by awarding it Provincial Nature Reserve status. Further work by Gao and Yu (1999) has given an idea of the population size and habitat usage of the Hainan Partridge, Hainan Peacock Pheasant and Silver Pheasant. The estimated Nanweiling populations respectively exceed 0.4%, 0.35%, and 0.25% of the estimated world populations (Gao, 1997; Gao, 1998b; Gao and Yu, 1995). Whether or not official nature reserve status is accorded, the fate of these populations will depend on effective hunting controls.

At Hongdoubu, it is suggested that a proportion of any profits generated from tourists visiting the egretty be given to the villagers, to encourage their continued protection of these birds at their vulnerable nesting site. A small educational display could be established at the

observation tower, to enhance the visitors' appreciation of the site, and their inclination to make donations.

We support the proposal to upgrade Nanweiling to Provincial Nature Reserve status, although more study, e.g. seasonal variation in habitat use of the two endemic Galliformes, would be beneficial before drawing up the boundaries. We supported a one-month survey of Galliformes and other bird species at Nanweiling in October and November 1998. The study showed that there was a sharp decrease in the number of pheasants and the continued existence of the three species, Silver Pheasant, Hainan Peacock Pheasant and Hainan Partridge at Nanweiling is believed to be at risk (Gao and Yu, 1999). This study highlighted the urgent need to protect the forests at Nanweiling.

Acknowledgements

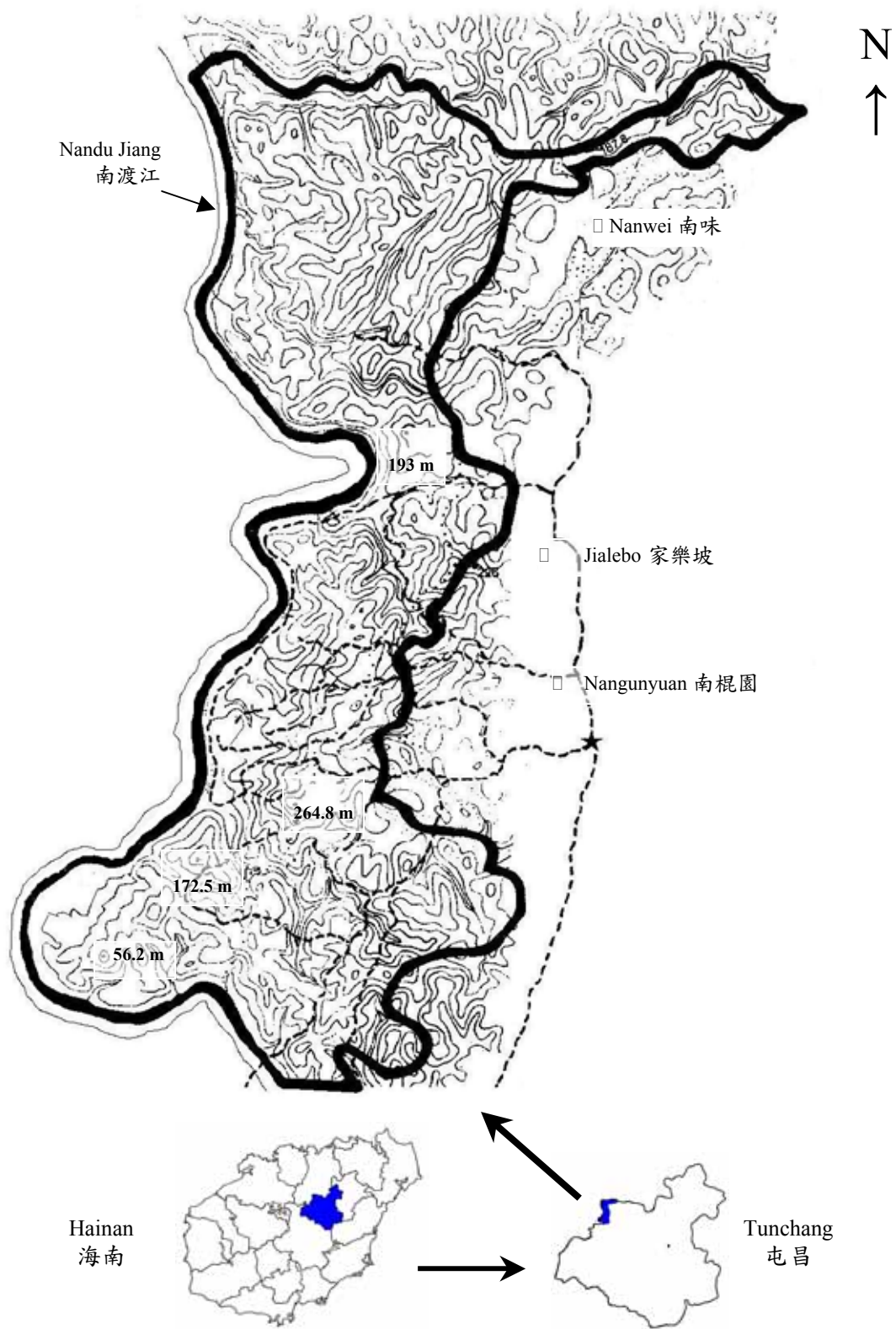
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Figure 1 Nanweiling Forest Area, Tungchang County, Central Hainan



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- Footpath/ Road ——— Nanweiling Forest boundaries River
- Village Forest Protection Station Not in scale