

BirdLife International Vietnam Programme and
Fauna & Flora International Indochina Programme
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**A Rapid Biodiversity Survey of
Che Tao Commune, Mu Cang Chai District,
Yen Bai Province, Vietnam**

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1. Introduction

This report presents the results of a rapid biodiversity survey of Che Tao commune, Mu Cang Chai district, Yen Bai province, conducted by the BirdLife International Vietnam Programme and the Fauna & Flora International (FFI) Indochina Programme, as part of the Danida-funded project *Improved conservation planning through institutional strengthening in Cambodia, Laos and Vietnam*.

1.1 Aim and objectives

The aim of the rapid biodiversity survey was to assess whether or not Che Tao commune and the surrounding area qualified as an Important Bird Area (IBA). IBAs are areas of international importance for bird conservation that meet internationally recognised criteria. IBAs are not only important for birds, but typically support a wide range of other important animal and plant species.

The specific objectives of the survey were to:

- collect data on the status and distribution of bird species at Che Tao, particularly globally threatened and restricted range species;
- collect data on the status and distribution of primate species at Che Tao, particularly Phayre's Langur *Trachypithecus phayrei*;
- collect data on the status and distribution of reptile and amphibian species at Che Tao.

All data collected during the survey contributed to the feasibility study for the establishment of a protected area at Che Tao, currently being prepared by the FFI Indochina Programme.

1.2 Study area

The study area was centred on Che Tao commune (21°37' to 21°46'N by 103°55' to 104°09'E) but also included an adjacent forest area in Muong La district, Son La province. Six days were spent surveying forest in the Nang Lu valley, which lies in Muong La district, and along the ridge to the north of this valley, which forms the border between Yen Bai and Son La provinces. A further four days were spent in areas of scrub and agricultural land around Phin Ho and Na Hang villages, Che Tao commune, and Nga Ba Kim village, Pung Luong commune.

1.3 Itinerary

15 April 2001	Travelled to Yen Bai town
16 April 2001	Travelled to Mu Cang Chai town
17 April 2001	Phin Ho village
18 April 2001	Na Hang village
19-25 April 2001	Nang Lu valley
26 April 2001	Phin Ho village
27 April 2001	Nga Ba Kim village
28 April 2001	Travelled to Yen Bai town
29 April 2001	Travelled to Hanoi

2. Birds

2.1 Methods

Birds were surveyed by observation and identification of calls. Survey effort was most intensive in the Nang Lu valley and along the ridge to the north of this valley, where observations were made continuously between 06h00 and 18h00, and for one or two hours in the night time. The principal habitat in the Nang Lu valley is primary lower montane evergreen forest, distributed at elevations between 1,000 and 1,900 m asl. The principal habitat on the ridge to the north of this valley is primary upper montane evergreen forest, distributed at elevations between 1,900 and 2,445 m asl. An additional four days were spent in scrub, agricultural land and other anthropogenic habitats around Na Hang, Phin Ho and Nga Ba Kim villages. However, because the majority of time on these days was spent walking, bird survey effort was limited to incidental records, and short periods in the early morning and late afternoon.

2.2 Results

A total of 81 bird species were recorded during the survey, all but one of which were identified to species level (Appendix 1). During previous surveys of the Che Tao area, an additional 26 bird species not recorded during this survey were recorded (Long *et al.* 2000). Therefore, the total number of species recorded in the Che Tao area to date stands at 107.

The bird community at Che Tao is characteristic of montane evergreen forest in northern Vietnam. The Sylviidae family is well represented with 39 species, a large proportion of which are restricted to montane forest. Che Tao supports a significant number of biome-restricted bird species. Twenty five species recorded at Che Tao are restricted to the Sino-Himalayan Subtropical Forests Biome. A further 12 species are restricted to the Sino-Himalayan Temperate Forests Biome.

Of the 107 species recorded at Che Tao, 98 species (92% of the total) have been recorded in or around Hoang Lien Nature Reserve, Lao Cai province, located 50 km to the north (Tordoff *et al.* 1999). This indicates a high degree of similarity between the avifaunas of the two sites, which is to be expected given that Che Tao is also situated in the Hoang Lien mountains and supports a similar diversity of montane habitat types. Because of the similarity between the two avifaunas, it is likely that many of the 347 bird species recorded at Hoang Lien Nature Reserve to date also occur at Che Tao. It is possible, however, that a few species restricted to the highest elevations at Hoang Lien Nature Reserve do not occur at Che Tao. Key species in this category may include the restricted-range species, Red-winged Laughingthrush *Garrulax formosus*.

Key species accounts

Rufous-necked Hornbill *Aceros nipalensis*

All field records of this species were from the Nang Lu valley (21°38'N 104°04'E). At 07h20 on 21 April 2001, a single bird was heard calling at 1,800 m asl in lower montane evergreen forest. At 11h50 on the same day, a single male (possibly the same bird) was seen in lower montane evergreen forest at 1,600 m asl. The bird flew along the northern side of the valley, in four short flights of about 200 m, interspaced by rests of about 30 seconds, during which time the bird called "kup kup kup". The wingbeats of the bird were audible but not as loud or grating of those of Wreathed Hornbill *A. undulatus*. At 10h00 on 22 April 2001, a single bird was heard in the distance but it was not possible to ascertain its precise location. At 11h50 and 12h55 on 23 April 2001, single males (possibly one but probably two birds) were seen in lower montane evergreen forest at 1,200 m asl. Finally, at 10h55 on 24 April 2001, a single male was seen in lower montane evergreen forest at 1,200 m asl.

The vegetation of the Nang Lu valley is lower montane evergreen forest between 900 and 1,900 m asl, and upper montane evergreen forest above 1,900 m asl. All records of Rufous-necked Hornbill were from lower montane evergreen forest, which is dominated by members of the Fagaceae and

Magnoliaceae, and the conifer *Fokienia hodginsii*. In places, *F. hodginsii* comprises over 25% of the mature trees. The forest canopy is closed and uniform, apart from emergent *F. hodginsii*. The understorey is dominated by the dwarf bamboo, *Arundinaria* sp. The forest is almost completely undisturbed, and there are no paths or other traces of human activity.

Mr Sung A Pha, the leader of Na Hang village, reported that Rufous-necked Hornbill occurs in three valleys close to Na Hang village. He estimated there to be six or seven birds in the Nang Lu valley, 16 birds in the Chua La valley, between 2 and 10 birds in the My Lang valley, and four birds in the Hang De Son Do valley. Therefore, Mr Pha's estimate of the total population of Rufous-necked Hornbill in the Na Hang area ranged from 28 to 37 birds.

Due to the limitations of the survey, it was not possible to assess the status of Rufous-necked Hornbill in other parts of Che Tao commune and adjacent forest areas. It is quite possible that small groups persist in remote valleys in other parts of the site. During May 2001, the members of the Che Tao Forest Protection Council will conduct a series of interviews with hunters in the other villages of Che Tao commune, in order to derive an estimate for the total population size at the site.

Mr Pha also provided information on the ecology of this species. He reported that the birds concentrate in flocks during the fruiting season between August and December, then split into pairs during the breeding season. The birds nest in cavities in large trees, with the female being sealed up inside. The male forages for food, and feeds the female and chicks through a small hole. This would account for the fact that only single males were observed during the survey: the females and chicks were presumable still inside the nesting trees.

This globally threatened species is listed in *Threatened Birds of the World* as Vulnerable (BirdLife International 2000). The main threats to this species globally are considered to be habitat fragmentation, degradation and loss, exacerbated by its dependence on large trees for feeding and nesting, and compounded by widespread hunting. All of these threats apply to the population at Che Tao. In the long term, the population at Che Tao is threatened by habitat fragmentation, as viable populations require large areas of forest. The potential exists, however, through reforestation, to create habitat corridors between the forest at Che Tao and larger forest blocks in Van Ban, Than Uyen and Sa Pa districts to the north, and, thereby, secure the long-term conservation of this species in the Hoang Lien mountains.

The biggest short-term threat to the population of Rufous-necked Hornbill at Che Tao is hunting. Anecdotal evidence indicates that, in recent years, hunting of Rufous-necked Hornbill has decreased to low levels. Mr Pha reported that, until three years ago, villagers used to hunt several birds every year but, since the departure of the only villager who owned a rifle to Lai Chau province, only one was hunted (the casque of this bird was seen and photographed). Furthermore, Mr Pha reported that, despite the bird's large size, it has very little meat, and the only use for the casque is decoration. However, given the small remaining population of this species, its congregatory behaviour and the high overall levels of hunting activity, the future of the Che Tao population remains insecure unless urgent conservation measures are put in place.

Brown Dipper *Cinclus pallasii*

On 26 April 2001, a single bird was seen along a river passing through a mosaic of scrub and agricultural land, and bordered by heavily degraded riverine forest, at 1,400 m asl, near Phin Ho village (21°43'N 104°06'E). On the following day, a single bird was seen along the same river, 500 m downstream.

Broad-billed Warbler *Tickellia hodgsoni*

On 19 April 2001, a single bird was seen in primary upper montane evergreen forest at 2,100 m asl, along the ridge north of the Nang Lu valley (21°39'N 104°05'E). On 20 and 22 April 2001, pairs of birds were seen in the same area. Broad-billed Warbler is one of the four restricted-range species that define the Fansipan and Northern Laos Secondary Endemic Bird Area (EBA) (Stattersfield *et al.* 2000). A second restricted-range species, Yellow-billed Nuthatch *Sitta solangiae*, was recorded at

Che Tao during a previous survey (Long *et al.* 2000). Therefore, Che Tao qualifies for inclusion within the secondary EBA.

Red-tailed Laughingthrush *Garrulax milnei*

On 20 April 2001, four birds were seen in a mixed flock, together with three Chestnut-crowned Laughingthrushes *G. erythrocephalus*, in primary upper montane evergreen forest at 2,000 m asl, along the ridge north of the Nang Lu valley (21°39'N 104°05'E).

Long-billed Wren Babbler *Rimator malacoptilus*

Single birds were seen on 22 and 24 April 2001, in primary upper montane evergreen forest at 2,100 m asl, along the ridge north of the Nang Lu valley (21°39'N 104°05'E). Both birds were observed moving through an understorey dominated by the dwarf bamboo, *Arundinaria* sp., and perching on bamboo stems about 30 cm above the ground. The form at Che Tao belongs to the subspecies *R. m. pasquieri*, which is endemic to the Hoang Lien mountains in Vietnam.

There are historical records of this species from the Sa Pa region (Delacour and Jabouille 1931, Eames and Ericson 1939). However, the species went unrecorded in Vietnam between 1939 and 2000, when it was rediscovered in Van Ban district, 20 km to the north of Che Tao (B. Long verbally 2001). The records from Che Tao indicate that this species may be not uncommon in suitable habitat, and the scarcity of records may simply reflect low survey effort and the fact that the species is easily overlooked.

Streaked Barwing *Actinodura souliei*

On 20 April 2001, a single bird was seen in primary upper montane evergreen forest at 2,100 m asl, along the ridge north of the Nang Lu valley (21°39'N 104°05'E). In the same area, two birds were seen on 21 April, one on 22 April, one on 23 April and two on 24 April. Within South-East Asia, this species is restricted to North-west Tonkin, where it is known from Hoang Lien Nature Reserve and Van Ban district (Tordoff *et al.* 1999, Robson 2000, B. Long verbally 2001).

2.3 Conclusions

Che Tao commune, together with adjacent forest areas, qualifies as an Important Bird Area (IBA) because it meets the following criteria:

Criterion A1: The site regularly holds significant numbers of a globally threatened species, or other species of global conservation concern.

Che Tao supports a viable population of the globally vulnerable Rufous-necked Hornbill. This is one of only two known populations of this species remaining in Vietnam. The other population is at Pu Mat Nature Reserve, Nghe An province, where it is described as "scarce and certainly much reduced by hunting pressure" (Grieser Johns ed. 2000).

Criterion A2: The site is known or thought to hold a significant component of a group of species whose breeding distributions define an EBA or secondary EBA.

Che Tao is known to support populations of two of the four restricted range species that define the Fansipan and Northern Laos Secondary EBA: Yellow-billed Nuthatch and Broad-billed Warbler. The site supports suitable habitat for a third restricted-range species, Ward's Trogon *Harpactes wardi*. To date, however, this species has not been recorded at the site. The site probably does not support the fourth restricted-range species found in the secondary EBA, Red-winged Laughingthrush, as there is only a very small area of forest above 2,400 m asl.

Criterion A3: The site is known or thought to hold a significant component of the group of species whose distributions are largely or wholly confined to one biome.

Che Tao supports 25 species restricted to the Sino-Himalayan Subtropical Forests Biome: Rufous-throated Partridge *Arborophila rufogularis*, Mountain Bamboo Partridge *Bambusicola fytchii*, Silver Pheasant *Lophura nycthemera*, Rufous-necked Hornbill *Aceros nipalensis*, Rusty-naped Pitta *Pitta oatesi*, Golden-throated Barbet *Megalaima franklinii*, Short-billed Minivet *Pericrocotus brevirostris*, Brown-breasted Bulbul *Pycnonotus xanthorrhous*, Mountain Bulbul *Hypsipetes maclellandii*, Black Bulbul *H. leucocephalus*, Orange-bellied Leafbird *Chloropsis hardwickii*, Hwamei *Garrulax canorus*, Red-tailed Laughingthrush *G. milnei*, Red-billed Leiothrix, *Leiothrix lutea*, Black-headed Shrike Babbler *Pteruthius rufiventer*, Blue-winged Minla *Minla cyanouroptera*, Streak-throated Fulvetta, *Alcippe cinereiceps*, Grey-cheeked Fulvetta, *A. morrisonia*, Black-headed Sibia *Heterophasia melanoleuca*, Grey-headed Parrotbill *Paradoxornis gularis*, Golden Parrotbill *P. verreauxi*, Black-faced Warbler *Abroscopus schisticeps*, White-gorgeted Flycatcher *Ficedula monileger*, Yellow-cheeked Tit *Parus sibilnotus* and Streaked Spiderhunter *Arachnothera magna*.

Che Tao supports a further 12 species restricted to the Sino-Himalayan Temperate Forests Biome: Hill Partridge *Arborophila torqueola*, Scaly Laughingthrush *Garrulax subunicolor*, Scaly-breasted Wren-babbler *Pnoepyga albiventer*, Long-tailed Wren Babbler *Spelaeornis chocolatinus*, Streaked Barwing *Actinodura souliei*, Chestnut-tailed Minla *Minla strigula*, Red-tailed Minla *M. ignotincta*, Golden-breasted Fulvetta *Alcippe chrysotis*, Stripe-throated Yuhina *Yuhina gularis*, Chestnut-headed Tesia *Tesia castaneocoronata*, Grey-bellied Tesia *T. cyaniventer* and Ashy-throated Warbler *Phylloscopus maculipennis*.

2.4 Recommendations

1. Further bird survey work at Che Tao should concentrate on lower montane evergreen forest, as this habitat type was under-represented during previous surveys, and may support a number of key species not yet recorded at the site, including Wood Snipe *Gallinago nemoricola* and Beautiful Nuthatch *Sitta formosa*. Further survey work in upper montane evergreen forest is unlikely to reveal a significant number of new species but may reveal the presence of Ward's Trogon at the site.
2. In the short term, conservation measures should be implemented to control hunting of birds, particularly Rufous-necked Hornbill. Such measures may include conducting conservation awareness activities, signing local-level decrees, and incorporating selective hunting restrictions into forest protection contracts.
3. Areas of undisturbed lower montane evergreen forest in the Nang Lu and similar valleys are the key habitat for Rufous-necked Hornbill. Selective logging of timber species must be controlled in these areas, as Rufous-necked Hornbill is dependent upon large trees for feeding and nesting.
4. In the long term, habitat fragmentation and loss are the biggest threats to bird conservation at Che Tao. This threat is particularly significant for species restricted to lower montane evergreen forest, such as Rufous-necked Hornbill and Yellow-billed Nuthatch, as it is this habitat type that is being lost at the greatest rate. Forest management at the site should focus on maintaining existing forest cover, particularly at elevations below 1,900 m asl, and on creating habitat corridors with nearby forest areas, most notably those in Van Ban district to the north.
5. A monitoring programme should be initiated, to monitor changes in the size and distribution of the Rufous-necked Hornbill population at Che Tao. Annual monitoring should take place in October, the peak fruiting season, when hornbill flocks can be counted and the population size in each valley assessed.

3. Primates

3.1 Methods

Interviews were conducted with three hunters from Na Hang village: Mr Sung Trang Chu, Mr Giang A Chua and Mr Sung A Su. Interviewees were asked detailed questions about the status and distribution of Phayre's Langur *Trachypithecus phayrei* in the area. Based on information obtained in these interviews, field survey effort was concentrated in the Nang Lu valley. Three days were spent searching for Phayre's Langur in the Nang Lu valley. In addition to the specific survey for Phayre's Langur, data on other primate species were collected incidentally.

3.2 Results

Phayre's Langur *Trachypithecus phayrei*

All three interviewees reported that two groups of Phayre's Langur still occur near Na Hang village: one group of seven or eight individuals in the Nang Lu valley, and one group of 15 to 17 individuals in the Chua La valley.

At 06h30 on 24 April 2001, a group of four langurs, comprising three adults and one golden infant, was observed along the Nang Lu stream (21°38'N 104°04'E) at 1,200 m asl. Fifteen minutes later, a group of two adults (possibly two of the animals from the first group), was observed at the same site. These observations confirm the presence of at least one group in the Nang Lu valley, with at least four individuals. Furthermore, these observations are consistent with the information provided by local people, and indicate that it is reliable.

At 15h00 on 24 April 2001, Mr Chua reported observing a group of up to 30 langurs, including seven infants (none of which held onto their parents), in the Chua La valley (21°39'N 104°05'E) at 2,000 m asl. Given that the interviewees earlier reported only 15 to 17 individuals in this valley, it is possible that the figure of 30 individuals was an exaggeration.

The site in the Chua La valley where langurs were observed in the afternoon of 24 April 2001 is 1.5 km to the north of the site in the Nang Lu valley where langurs were observed in the morning, and the two sites are separated by a mountain ridge. Consequently, it is very likely that the observations were of two separate groups. Based on the interview data and field records, it would appear that two groups of Phayre's Langur, totalling 22 to 25, although possibly as many as 38, individuals, still occur near Na Hang village, and that both groups are breeding.

Hunting is a serious threat to the Phayre's Langur population at Che Tao. Mr Su reported that, in 1993, a hunter from Ta Dong village shot nine langurs on one occasion in the Chua La valley. Given its small size, a few similar incidents could eradicate the population.

Western Black Crested Gibbon *Nomascus concolor concolor*

Gibbons were heard calling in the Nang Lu valley every day between 20 and 24 April 2001. On most days, at least four groups were heard. Gibbon calling was concentrated between 06h00 and 07h00, with the longest call being that of a lone male, which lasted for 19 minutes. On 24 April 2001, one group of gibbons, comprising one adult female, two adult males and a black infant, was observed in the Nang Lu valley (21°38'N 104°04'E). The gibbon population at Che Tao has been studied in more detail during previous surveys (e.g. Long *et al.* 2000).

Bear Macaque *Macaca arctoides*

On 23 April 2001, many macaque scat were found along the Nang Lu stream (21°38'N 104°04'E) at 1,100 m asl. Mr Su identified these as belonging to Bear Macaque, and reported that a group of 20 to 30 individuals occurs in the Nang Lu valley.

3.3 Conclusions

Previous surveys identified Che Tao as being of international importance for the conservation of Western Black Crested Gibbon. The results of this survey confirm the presence of Phayre's Langur, which had hitherto only been recorded at interview. Although the distribution of Phayre's Langur at Che Tao is not yet fully known, it would appear that the population is quite small. However, given that Che Tao is one of the few sites in Vietnam from where there are recent confirmed records of this species, the population at Che Tao is probably of national importance.

3.4 Recommendations

1. Further surveys are required to determine the status and distribution of Phayre's Langur in other parts of the Che Tao area. Surveys should employ interviews with knowledgeable local people, followed up with field observations to confirm the presence of langurs in areas where they are reported from.
2. The most serious threat to the Phayre's Langur population in the short term is hunting. Conservation measures that could be implemented include conservation awareness activities and local-level decrees not to hunt this species.
3. In the long term, habitat fragmentation and loss are the biggest threats to the Phayre's Langur population, which is probably too small to be viable in the long term, unless it can maintain genetic exchange with populations in neighbouring forest areas. Forest management at the site should focus on protecting the existing forest and creating habitat corridors with nearby forest areas that may support populations of the species.

4. Reptiles and amphibians

4.1 Methods

Reptiles and amphibians were surveyed by observation. Wherever possible, animals were captured, photographed and released. Survey effort was concentrated in the night time, between 19h00 and 21h00, and focussed on aquatic micro-habitats, such as streams, ponds and paddy fields. In some areas, searches for amphibians and reptiles were also made during the day time. Incidental records were also made throughout the survey. Furthermore, interviews were conducted with local people to collect information on easily identifiable reptile species, such as turtles.

Five nights were spent surveying in primary upper montane evergreen forest along the ridge to the north of the Nang Lu valley, between 2,000 and 2,200 m asl. One night was spent surveying along the Nang Lu stream, in primary lower montane evergreen forest, at 1,200 m asl. Three nights were spent surveying in scrub, agricultural land and other anthropogenic habitats near Na Hang and Phin Ho villages.

4.2 Results

A total of 15 reptile and 18 amphibian species were recorded during the survey (Appendix 2). All species were observed or collected, except for six reptile species that were recorded at interview. All but four species were identified to species level. As no specimens were kept, all species listed in Appendix 2 should be considered to be preliminary identifications only.

Three of the species recorded during the survey, Big-headed Turtle *Platysternon megacephalum*, Impressed Tortoise *Manouria impressa* and Burmese Python *Python molurus*, are listed in the 2000 IUCN Red List of Threatened Species (IUCN 2000). None of these species was observed during the field survey, only recorded at interview.

4.3 Conclusions

The results of this survey provide only preliminary information on the reptile and amphibian diversity of Che Tao commune and the surrounding area. At Hoang Lien Nature Reserve, which supports a similar range of montane habitats to Che Tao, 42 species of amphibian have been recorded to date (Ohler *et al.* 2000). Therefore, although only 18 species were recorded at Che Tao during the survey, the total amphibian diversity at the site can be predicted to be much higher. The same is probably true for reptile diversity.

The main threats to reptiles and amphibians at Che Tao are over-exploitation and habitat loss. Local people reported that most amphibian species were considered edible by local people, and that nearly all species of snake were captured for sale. Over-exploitation is probably only a severe threat to the populations of a number of turtle and snake species, including the globally threatened *Platysternon megacephalum* and *Manouria impressa*.

4.4 Recommendations

1. Further surveys are required to more completely investigate the diversity and distribution of reptiles and amphibians at Che Tao. These surveys should take place at different times of the year, in order to allow for seasonal variations in reptile and amphibian activity, and involve specimen collection, in order to facilitate precise identifications.
2. Further studies are required to evaluate the importance of Che Tao for the conservation of *Platysternon megacephalum* and *Manouria impressa*, to assess threats to their populations, and to propose appropriate conservation measures.

References

- BirdLife International (2000) *Threatened birds of the world*. Barcelona and Cambridge, U.K.: Lynx Edicions and BirdLife International.
- Cox, M. J., van Dijk, P. P., Nabhitabhata, J. and Thirakhupt, K. (1998) *Snakes and other reptiles of Thailand and Southeast Asia*. Bangkok: Asia Books.
- Grieser Johns, A. ed. (2000) *Pu Mat: a biodiversity survey of a Vietnamese protected area*. Vinh: Social Forestry and Nature Conservation in Nghe An Province.
- Inskipp, T., Lindsey, N. and Duckworth, W. (1996) *Annotated checklist of the birds of the Oriental Region*. Sandy, Bedfordshire: Oriental Bird Club.
- IUCN (2000) *2000 IUCN Red List of Threatened Species*. Gland and Cambridge: IUCN.
- Long, B., Le Khac Quyet and Le Trong Dat (2000) Unpublished report to Fauna & Flora International Indochina Programme.
- Nguyen Van Sang and Ho Thu Cuc (1996) [*Checklist of reptiles and amphibians in Vietnam*.] Hanoi: Scientific and Technical Publishing House. (In Vietnamese.)
- Ohler, A., Marquis, O., Swan, S. and Grosjean, S. (2000) Amphibian biodiversity of Hoang Lien Nature Reserve (Lao Cai province, northern Vietnam) with description of two new species. *Herpetozoa* 13: 71-87.
- Stattersfield, A. J., Crosby, M. J., Long, A. J. and Wege, D. C. (1998) *Endemic bird areas of the world: priorities for biodiversity conservation*. Cambridge, U.K.: BirdLife International.
- Tordoff, A., Swan, S., Grindley, M. and Siurua, H. (1999) *Hoang Lien Nature Reserve: biodiversity survey and conservation evaluation 1997/8*. London: Society for Environmental Exploration.

Appendix 1: List of bird species recorded in and around Che Tao commune

No.	Common Name	Order, Family, Genus and Species	Notes
		Galliformes	
		Phasianidae	
1	Chinese Francolin	<i>Francolinus pintadeanus</i>	
2	Hill Partridge	<i>Arborophila torqueola</i>	
3	Rufous-throated Partridge	<i>A. rufogularis</i>	
4	Mountain Bamboo Partridge	<i>Bambusicola fytchii</i>	
5	Silver Pheasant	<i>Lophura nycthemera</i>	
6	Grey Peacock Pheasant	<i>Polyplectron bicalcaratum</i>	
		Piciformes	
		Megalaimidae	
7	Great Barbet	<i>Megalaima virens</i>	
8	Golden-throated Barbet	<i>M. franklinii</i>	
		Bucerotiformes	
		Bucerotidae	
9	Rufous-necked Hornbill	<i>Aceros nipalensis</i>	VU
		Trogoniformes	
		Trogonidae	
10	Red-headed Trogon	<i>Harpactes erythrocephalus</i>	
		Cuculiformes	
		Cuculidae	
11	Large Hawk Cuckoo	<i>Hierococcyx sparverioides</i>	
12	Hodgson's Hawk Cuckoo	<i>H. fugax</i>	
13	Eurasian Cuckoo	<i>Cuculus canorus</i>	
14	Oriental Cuckoo	<i>C. saturatus</i>	
15	Drongo Cuckoo	<i>Surniculus lugubris</i>	
		Centropodidae	
16	Greater Coucal	<i>Centropus sinensis</i>	
17	Lesser Coucal	<i>C. bengalensis</i>	
		Apodiformes	
		Apodidae	
18	Silver-backed Needletail	<i>Hirundapus cochinchinensis</i>	
		Strigiformes	
		Strigidae	
19	Collared Owlet	<i>Glaucidium brodiei</i>	
		Caprimulgidae	
20	Nightjar species	<i>Caprimulgus</i> sp.	
		Columbiformes	
		Columbidae	
21	Barred Cuckoo Dove	<i>Macropygia unchall</i>	
		Ciconiiformes	
		Scolopacidae	
22	Common Sandpiper	<i>Actitis hypoleucos</i>	
		Accipitridae	
23	Crested Goshawk	<i>Accipiter trivirgatus</i>	
		Passeriformes	
		Corvidae	
24	Common Green Magpie	<i>Cissa chinensis</i>	
25	Short-billed Minivet	<i>Pericrocotus brevirostris</i>	

No.	Common Name	Order, Family, Genus and Species	Notes
26	Yellow-bellied Fantail	<i>Rhipidura hypoxantha</i>	
27	White-throated Fantail	<i>R. albicollis</i>	
28	Ashy Drongo	<i>Dicrurus leucophaeus</i>	
29	Spangled Drongo	<i>D. hottentottus</i>	
		Cinclidae	
30	Brown Dipper	<i>Cinclus pallasii</i>	
		Muscicapidae	
31	Lesser Shortwing	<i>Brachypteryx leucophrys</i>	
32	Verditer Flycatcher	<i>Eumyias thalassina</i>	
33	Large Niltava	<i>Niltava grandis</i>	
34	Hill Blue Flycatcher	<i>Cyornis banyumas</i>	
35	Plumbeous Water Redstart	<i>Rhyacornis fuliginosus</i>	
36	White-crowned Forktail	<i>Enicurus leschenaulti</i>	
37	Common Stonechat	<i>Saxicola torquata</i>	
38	Grey Bushchat	<i>S. ferrea</i>	
		Paridae	
39	Yellow-cheeked Tit	<i>Parus spilonotus</i>	
		Hirundinidae	
40	Barn Swallow	<i>Hirundo rustica</i>	
		Pycnonotidae	
41	Brown-breasted Bulbul	<i>Pycnonotus xanthorrhous</i>	
42	Mountain Bulbul	<i>Hypsipetes mccllellandii</i>	
43	Black Bulbul	<i>H. leucocephalus</i>	
		Cisticolidae	
44	Hill Prinia	<i>Prinia atrogularis</i>	
		Sylviidae	
45	Chestnut-headed Tesia	<i>Tesia castaneocoronata</i>	
46	Grey-bellied Tesia	<i>T. cyaniventer</i>	
47	Mountain Tailorbird	<i>Orthotomus cuculatus</i>	
48	Ashy-throated Warbler	<i>Phylloscopus maculipennis</i>	
49	Yellow-browed Warbler	<i>P. inornatus</i>	
50	Golden-spectacled Warbler	<i>Seicercus burkii</i>	
51	Chestnut-crowned Warbler	<i>S. castaneiceps</i>	
52	Broad-billed Warbler	<i>Tickellia hodgsoni</i>	RRS
53	Black-faced Warbler	<i>Abroscopus schisticeps</i>	
54	Chestnut-crowned Laughingthrush	<i>Garrulax erythrocephalus</i>	
55	Red-tailed Laughingthrush	<i>G. milnei</i>	
56	Long-billed Wren Babbler	<i>Rimator malacoptilus</i>	
57	Pygmy Wren Babbler	<i>Pnoepyga pusilla</i>	
58	Long-tailed Wren Babbler	<i>Spelaornis chocolatinus</i>	
59	Silver-eared Mesia	<i>Leiothrix argentauris</i>	
60	Red-billed Leiothrix	<i>L. lutea</i>	
61	Chestnut-fronted Shrike Babbler	<i>Pteruthius aenobarbus</i>	
62	Streaked Barwing	<i>Actinodura souliei</i>	
63	Blue-winged Minla	<i>Minla cyanouroptera</i>	
64	Chestnut-tailed Minla	<i>M. strigula</i>	
65	Red-tailed Minla	<i>M. ignotincta</i>	
66	Golden-breasted Fulvetta	<i>Alcippe chrysotis</i>	
67	Rufous-winged Fulvetta	<i>A. castaneiceps</i>	
68	Streaked-throated Fulvetta	<i>A. cinereiceps</i>	

No.	Common Name	Order, Family, Genus and Species	Notes
69	Rusty-capped Fulvetta	<i>A. dubia</i>	
70	Grey-cheeked Fulvetta	<i>A. morrisonia</i>	
71	Black-headed Sibia	<i>Heterophasia melanoleuca</i>	
72	Whiskered Yuhina	<i>Yuhina flavicollis</i>	
73	Stripe-throated Yuhina	<i>Y. gularis</i>	
74	Grey-headed Parrotbill	<i>Paradoxornis gularis</i>	
75	Golden Parrotbill	<i>P. verreauxi</i>	
		Nectariniidae	
76	Fire-breasted Flowerpecker	<i>Dicaeum ignipectus</i>	
77	Mrs Gould's Sunbird	<i>Aethopyga gouldiae</i>	
78	Green-tailed Sunbird	<i>A. nipalensis</i>	
		Passeridae	
79	Eurasian Tree Sparrow	<i>Passer montanus</i>	
80	White Wagtail	<i>Motacilla alba</i>	
		Fringillidae	
81	Crested Bunting	<i>Melophus lathami</i>	

Bird names, sequence and species limits follow Inskipp *et al.* (1996).

Notes: VU = Vulnerable as per BirdLife International (2000); RRS = Restricted-range Species as per Stattersfield *et al.* (1998).

Appendix 2: Preliminary list of reptile and amphibian species recorded in and around Che Tao commune

No.	Class, Order, Family, Genus and Species	Data Source	Habitat	Notes
	Reptilia			
	Squamata:			
	Agamidae			
1	<i>Acanthosaura lepidogaster</i>	O	2	
	Scincidae			
2	<i>Mabuya longicaudata</i>	O	3	
	Lacertidae			
3	<i>Takydromus sexlineatus</i>	O	3	
	Boidae			
4	<i>Python molurus</i>	I	2,3	NT
	Xenopeltidae			
5	<i>Xenopeltis unicolor</i>	I	3	
	Colubridae			
6	<i>Elaphe porphyracea</i>	O	1	
7	<i>Elaphe radiata</i>	O	3	
8	<i>Rhabdophis nigrocinctus</i>	O	3	
9	<i>Rhabdophis subminiatus</i>	O	3	
10	<i>Rhynchophis boulengeri</i>	O	2	
11	<i>Enhydris</i> sp.	O	3	
	Elapidae			
12	<i>Bungarus fasciatus</i>	I	3	
	Viperidae			
13	<i>Trimeresurus</i> cf. <i>albolabris</i>	I	1,2	
	Testudinata:			
	Platysternidae			
14	<i>Platysternon megacephalum</i>	I	1	EN
	Testudinidae			
15	<i>Manouria impressa</i>	I	1	VU
	Amphibia			
	Anura:			
	Pelobatidae			
16	<i>Leptobrachium pelodytoides</i>	O	1	
17	<i>Megophrys minor</i>	O	1	
	Bufonidae			
18	<i>Bufo melanostictus</i>	O	3	
19	<i>Bufo</i> sp.	O	1	
	Hylidae			
20	<i>Hyla</i> cf. <i>annectans</i>	O	1	
	Ranidae			
21	<i>Amolops</i> sp.	O	1,2	
22	<i>Fejervarya limnocharis</i>	O	3	
23	<i>Limnonectes kuhlii</i>	O	2	
24	<i>Paa verrucospinosa</i>	O	1,2	
25	<i>Rana andersoni</i>	O	1	
26	<i>Rana livida</i>	O	3	
27	<i>Rana taipehensis</i>	O	3	
28	<i>Rana</i> sp.	O	1	

No.	Class, Order, Family, Genus and Species	Data Source	Habitat	Notes
	Rhacophoridae			
29	<i>Philautus</i> sp.	O	1	
30	<i>Polypedates megacephalus</i>	O	2,3	
31	<i>Rhacophorus</i> cf. <i>leucomystax</i>	O	2,3	
	Microhylidae			
32	<i>Microhyla heymonsi</i>	O	3	
33	<i>Microhyla pulchra</i>	O	3	

Reptile and amphibian names, sequence and species limits follow Cox *et al.* (1998) and Ohler *et al.* (2000).

Data source: O = Observed or captured, photographed and released; I = Interview.

Habitat: 1 = Primary montane forest; 2 = Secondary montane forest; 3 = Scrub, agricultural land and other anthropogenic habitats.

Notes: EN = Endangered; VU = Vulnerable; NT = Near Threatened as per IUCN (2000).