

Survey of the avifauna at Muong Nhe Nature Reserve, Dien Bien province, Vietnam

LE MANH HUNG, MARK B. ROBBINS, NATHAN H. RICE & ERICK A. GARCÍA-TREJO

We documented 198 species within the Muong Nhe Nature Reserve in extreme north-western Vietnam during March–April 2011. The first Vietnam records were confirmed for three warbler species (Phylloscopidae), including the Sakhalin Leaf Warbler *P. borealoides*, for which there are very few records for South-East Asia. The status and distribution for a number of other species were clarified for this poorly known area of Vietnam. The Muong Nhe Nature Reserve and the contiguous Phou Dendin NPA in Laos are imperative to the continued presence of the relatively high biodiversity in this region. Not only are these reserves essential to resident species, but they are an important stopover for migrant birds.

INTRODUCTION

Human pressure on the Indochina landscape continues unabated and much of the forest has disappeared and what little remains is heavily impacted (see Sodhi *et al.* 2004; also Google Earth). For example, the following rates of deforestation occurred in Vietnam (–99.7%), Laos (–24.1%), and Cambodia (–22.0%) between the periods of 2000–2005 and 2005–2010 (http://news.mongabay.com/2010/1006-fao_forest_cover.html). Most of the megafauna (elephants, large cats, primates, large hornbills) has been eliminated and the status and distribution of the remaining fauna and flora have been severely altered (Sodhi & Brook 2006). Thus, there is an urgency to document and preserve the remaining biodiversity before it is further eroded.

Into the 1970s, the Muong Nhe Nature Reserve, located in the extreme north-western corner of Vietnam abutting Laos and China, still maintained a sizeable Asian Elephant *Elephas maximus* population, as well as other large mammals (Cox *et al.* 1992, Tu *et al.* 2001). However, by the 1980s most of that fauna had disappeared. By 1990, less than 20% of the reserve was forested, and much of that was secondary (Cox *et al.* 1992, Hill *et al.* 1997). The reserve now consists of only c.46,000 ha of which c.26,000 ha is mature forest that is in a strictly protected zone and c.20,000 ha that is considered a forest recovery area (Dien Bien Agriculture Department 2008). Most of the moist evergreen forest that remains is degraded, with the subtropical moist evergreen forest on the steep slopes and ridges being the least impacted vegetation in the reserve. The reserve is highly mountainous, average height c.1,200 m, with Mount Phu Nam Man reaching 2,124 m (Tu *et al.* 2001).

In part because of its remoteness, the reserve has received minimal biotic assessment. For example, the avifauna has had only two preliminary inventories, one of which was concentrated at the southern end of the reserve (Hill *et al.* 1997) and the other a very short survey during October 2000 (Tu *et al.* 2001). In order to provide a more complete inventory of the avifauna we worked the northern sector of the reserve from mid-March to mid-April 2011 when migration was occurring and most of the species were initiating breeding, i.e., period of increased vocalisations, and thus detectability was increased.

STUDY AREA AND METHODS

At the northern end of the reserve, two sites (22.386°N 102.238°E, 850 m; 22.261°N 102.224°E, 1,000 m) c.3 km apart, were surveyed from 18 March–13 April 2011. The first site was worked from 18 March–1 April and 12–13 April and the second from 1 April–11 April. The first site was at a guard station along a narrow, recently paved road that transects the reserve and leads to the China border. From the station we worked along the road and various trails into

scrub and secondary forest. Agricultural fields, scrub, young secondary forest, and taller, continuous secondary forest (along a ridge c.1 km to the south-west) were surveyed. Mist-net effort (12 m nets, maximum of 26 nets at first site; maximum of 25 nets at the second camp; opened for daylight hours only, usually from 06h00 to 17h00), observations, and audio recordings were made daily and were concentrated within 2–3 km of each camp. At the first site, nets were placed in a variety of habitats, including across streams and at edges of agricultural fields and secondary forest, and 14 were placed along a ridge in tall, continuous secondary forest. At the second site, a tented camp established along a forest stream, all nets were placed in taller, continuous selectively logged forest, with three nets placed across a closed-canopy forest stream.

On 18 March, and for at least the previous three consecutive days, it rained and was unseasonably cool (local people, pers. comm.). As a result of these cool conditions, House Swifts *Apus affinis* appeared to have gone into torpor with several recovered dead or in severe weakened condition on 17 March at the base of buildings in the town of Muong Nhe and at the reserve headquarters (KUBI 23361-4). On 25–27 March, it rained for periods of several hours (primarily at night) with relatively strong winds that were primarily out of the east. It was overcast through the afternoon of 31 March. As a result of precipitation, most streams had running water. Temperature low for nights at the first camp was 53°F on 27 March. During work at the second camp the days were mostly sunny with a prolonged, mid-morning rain only on 9 April. MBR's digital audio recordings are available online at the Macaulay Library (ML), Laboratory of Ornithology, Cornell University, USA. Specimens are deposited at KUBI (Kansas University Biodiversity Institute) and data are available online via ORNIS, a distributed database. Taxonomy and nomenclature primarily follow Robson (2008), but we have adopted more recent updates (e.g. Moyle *et al.* 2012) that clearly provide a more thorough perspective on nomenclature and generic and species relationships.

RESULTS AND DISCUSSION

We recorded a total of 198 avian species of which 85% were documented with concrete evidence, i.e. specimen, audio recording and/or photographs (Appendix). The Muong Nhe Reserve species list prior to our survey (163 species) was based on two inventories that involved sight observations only: one conducted at the south end of the reserve by Hill *et al.* in 1997 (n=158 species) and the other a short 'rapid' survey in October 2000 (Tu *et al.* 2001; n=102 species). The latter effort added five species to the earlier inventory. Combining results from the two earlier inventories and our survey the Muong Nhe list now stands at 232 species (34 species were recorded during the earlier surveys that we did not encounter). In addition to the 35 new species for the Muong Nhe list, we

documented the first confirmed Vietnam records for three warbler species (Hartert's Leaf Warbler *Phylloscopus goodsoni*, Sakhalin Leaf Warbler *P. borealoides* and Martens's Warbler *Seicercus omeiensis*) and we clarified the status for several other species in this region (see species accounts).

During our survey, most species were vocalising; specimen data and behaviour confirmed that many species were in the initial stages of breeding. The facts that our inventory occurred at the beginning of the breeding season, was longer in duration, accessed the northern section of the reserve, and included, albeit briefly, elevations up to c.1,500 m, probably explain why we recorded a greater number of species than the earlier surveys. Access to a ridge at 1,200–1,500 m revealed submontane taxa such as Rufous-throated Partridge *Arborophila rufogularis* and Blyth's Shrike Babbler *Pteruthius aeralatus* that we did not record elsewhere and which went unrecorded during the earlier surveys.

At least 34 species of migrant (defined here where at least some individuals of a species were migrating, although some individuals may be summer or permanent residents at this site) were recorded (Appendix). As a result of a mostly unimpeded view of the horizon at our first camp, we noted small numbers of migrant raptors moving north on several days. Dramatic changes in the relative abundance, undoubtedly related to migration, of *Phylloscopus* species and the Grey-headed Canary-flycatcher *Culicicapa ceylonensis* were noted in ridge secondary forest at our first camp. Given the degree of deforestation outside the Muong Nhe Reserve, we presume that this site is a now a key stopover for migrants.

Despite the common presence of ground-level snares, all three *Arborophila* species were frequently heard and occasionally flushed. Grey Peacock-pheasant *Polyplectron bicalcaratum* was frequently heard, especially at the second camp, but only one group of Silver Pheasant *Lophura nycthemera* was observed (second camp). In addition to snares, we discovered unauthorised mist-nets in the forest and observed people shooting birds (primarily drongos *Dicrurus*) with sling-shots at our first camp. Buffalo were ubiquitous at the first site and there were recent signs of this species at the second. No large native mammals were recorded at the first site, but a troop of Assam Macaque *Macaca assamensis* were encountered just above 1,200 m at the second camp (ML 169313).

Surprisingly, no *Turdus* or *Zoothera* thrushes have yet been recorded for Muong Nhe, although several species undoubtedly occur at least as migrants if not also as winter residents. Two *Zoothera* species have been recorded in the contiguous Phou Dendin National Protected Area (NPA) in Laos (Fuchs *et al.* 2007). We were discouraged that parakeets were non-existent—Red-breasted Parakeet *Psittacula alexandri* was recorded by Tu *et al.* (2001)—and only a single hornbill species was recorded and this only at higher elevations in the more remote area that we surveyed; we suspect that these taxa had suffered the combined effects of the removal of large trees and of hunting/trapping. The absence or low density of large woodpeckers may be a reflection of the lack of large dead trees as such trees were scarce and presumably had been used for firewood near our first camp.

Additional inventories are needed as we surveyed only a small portion of the reserve and the following areas were not investigated: the uppermost montane areas (above 1,500 m), lower elevations near the park entrance (c.700 m), and the primary forest near the Laos border where the highly endangered Northern White-cheeked Gibbon *Nomascus leucogenys* is found. Surveys in those areas and during other seasons are needed to document both resident, migrant and winter residents that use this reserve.

CONSERVATION PRIORITIES

Muong Nhe Reserve and the adjacent Phou Dendin NPA in Laos are imperative to the continued presence of the relatively high

biodiversity in this region. Indeed, we presume proper protection in these reserves is critical to the endangered Northern White-cheeked Gibbon. It is likely that the core sections, along the border of each country, of both reserves are the only areas where the gibbon, other large mammals, the Great Hornbill *Buceros bicornis* and perhaps even the Globally Threatened Rufous-necked Hornbill *Aceros nipalensis* may persist. This *Aceros* may still have been present in Phou Dendin NPA during 2004–2005 (Fuchs *et al.* 2007), and efforts should be made to ascertain if the species still occurs in the upper elevations of the western boundary of Muong Nhe. Not only are these reserves essential to resident species (permanent, summer or winter), but they certainly are an important stopover for migrant birds. As one would expect given that they are contiguous, there is extensive overlap in species composition between Muong Nhe and Phou Dendin NPA; however, each reserve also has a unique set of species. These reserves should be treated as a single ecosystem with coordinated international conservation efforts.

SPECIES ACCOUNTS

Blyth's Kingfisher *Alcedo hercules*

We recorded at least three individuals (photographed) along the closed-canopy stream at our second site. This species is considered Near Threatened by BirdLife International because of its low population size and narrow habitat requirements. Fuchs *et al.* (2007) encountered the species in Phou Dendin NPA in abutting Laos and surmised that the population was large and continuous between these two reserves.

Rufous-bellied Niltava *Niltava sundara*

The extreme plumage similarity in both males and females among *N. sundara*, the Fujian *N. davidi* and Vivid *N. vivida* niltavas, coupled with all three species being at least partially migratory, has obfuscated the status and distribution of these taxa in northern Indochina. At Muong Nhe we recorded only *sundara* (5 males, 2 females). Interestingly, one of the males (KUBI 119665) had somewhat enlarged testes, 5.5 × 2.5 mm and enlarged seminal vesicles, which may indicate breeding, although none of the other specimens had enlarged gonads. No vocalisations were detected, although it is easy to overlook this species's inconspicuous song and calls.

According to recent literature (Dyrce 2006, Robson 2008), the nearest known breeding range of *sundara* is in Yunnan and Guizhou. However, there are four audio recordings of song by D. Edwards from Mount Fansipan, Vietnam, during May 2010 (www.xeno-canto.org; xc 65076-9). Moreover, MBR audio-recorded (ML 167779) a territorial male *sundara* on 29 March 2012 at c.1,600 m, Van Ban Nature Reserve, Lao Cai province, Vietnam (22.949°N 104.255°E) and specimens from there had enlarged testes (unpubl. data).

Pale Blue Flycatcher *Cyornis unicolor*

This species was an uncommon breeder at Muong Nhe. At 850 m, a mist-netted female had an unshelled egg in the oviduct on 27 March (KUBI 119363) and at 1,000 m a mist-netted male on 5 April had enlarged testes (KUBI 119648). In addition, males were persistently singing from > 8 m above the ground at c.1,500 m (ML 169212-3). Neither Dyrce (2006) nor Robson (2008) lists this as a breeder for West Tonkin.

Chestnut-tailed Starling *Sturnus malabaricus*

Flocks ranging in size from 4 to 25 individuals were recorded daily and photographed in agricultural fields and at the edge of secondary forest from the park entrance at c.850 m up to above the roadside guard station at c.1,000 m. Robson (2008) does not list the species for West Tonkin.

Pied Bushchat *Saxicola caprata*

At least five (four males and one female) were seen and photographed in open areas with grass at the northern boundary of the reserve. Robson (2008) did not list this species for West Tonkin.

Ashy Minivet *Pericrocotus divaricatus*

Although this was the least common minivet, it was seen and photographed at both of our sites. Apparently these are the first records for West Tonkin (Robson 2008).

Rosy Minivet *Pericrocotus roseus*

Robson (2008) mentioned that the status of this minivet was uncertain in West Tonkin. We found the species to be common, with multiple groups, ranging from 4 to c.10 individuals. Although most were seen in what appeared to be small-sized, monospecific flocks, one male (KUBI 119322) had enlarged testes, 8×4 mm, but two females did not have enlarged ova; so whether this species breeds in the region is still unresolved.

Phylloscopus and *Seicercus*

Species in these two genera are notoriously difficult to identify. Because of the extreme similarity in morphology among taxa of both genera, often voice and genetics are the only means of confirming identification. During our Muong Nhe fieldwork multiple taxa of these two groups were encountered, but very little song was heard or recorded. Thus, we relied on genetic analyses (sequence data from the ND2 gene; sequences pending on Genbank) from specimens to provide unequivocal identifications (Appendix). As a result of the difficulty in identification both in the field and in the hand, the status and distribution of these taxa are poorly known. This underscores the importance of collecting data-rich specimens to accompany genetic and vocal sampling. Below we summarise our findings from Muong Nhe.

Six species of *Phylloscopus* were recorded, including two that apparently are new for Vietnam: Hartert's Leaf Warbler *Phylloscopus goodsoni* (n=4 specimens), and a single Sakhalin Leaf Warbler *P. borealoides*. Hartert's and Claudia's Warblers *P. claudiae* (n=2 specimens) are recently recognised species of the Blyth's Warbler *P. reguloides* complex (Olsson *et al.* 2005). *Phylloscopus goodsoni* also has been confirmed, via genetic means, to have occurred during March 2005 in the abutting Phou Dendin NPA (Fuchs *et al.* 2007), and there is specimen documentation for *P. claudiae* from Ha Giang province, Vietnam (Vogel *et al.* 2003). The winter and migration status and distribution of the range-restricted *P. borealoides* is especially poorly known (Bairlein 2006, Brazil 2009) and our specimen (KUBI 119459) apparently represents the first for Vietnam and one of the very few for South-East Asia as a whole. Finally, our documentation (ML 169180) of territorial Yellow-vented Warbler *P. cantator* appears to represent the first breeding record for West Tonkin (Robson 2008); Fuchs *et al.* (2007) did not find this warbler during March surveys in adjacent Phou Dendin NPA.

We recorded three species of *Seicercus*, all of which are known from this general region, but for which specimen documentation is apparently lacking for Vietnam (Martens *et al.* 1999, 2003, Bairlein 2006). Of ten *Seicercus* netted, eight were Martens's Warbler *S. omeiensis*, one (plus another individual audio recorded, ML 169162) Bianchi's Warbler *S. valentini*, and one Grey-crowned Warbler *S. tephrocephalus*. The latter two have been reported for Vietnam based on audio recordings deposited on xeno-canto.

ACKNOWLEDGEMENTS

We are grateful to Muong Nhe Reserve personnel, especially Tran Xuan Tam, Nguyen Viet Cuong, Dao Cong Tien and Nguyen Quoc Tang. We thank Charles Linkem for his assistance and camaraderie. Pete Hosner and Arpad

Nyari kindly provided sequence data for identifying *Phylloscopus* and *Seicercus* specimens. Craig Robson identified several species in audio recordings. Paul Sweet reconfirmed identification of Ha Giang province *Phylloscopus* and two anonymous reviewers provided valuable comments on the manuscript.

REFERENCES

- Bairlein, F. (2006) Family Sylviidae (Old World warblers). Pp.492–709 in J. del Hoyo, A. Elliott & D. A. Christie, eds. *Handbook of the birds of the world*, 11. Barcelona: Lynx Edicions.
- Brazil, M. (2009) *Birds of East Asia*. Oxford: Oxford University Press.
- Cox, C. R., Vu Van Dung & Pham Mong Giao (1992) Report of a management feasibility study of the Muong Nhe Nature Reserve (November/December 1991). Hanoi: World Wildlife Fund/Ministry of Forestry.
- Dien Bien Agriculture Department (2008) A revision of the investment plan for the period from 2008–2020 of Muong Nhe Nature reserve. Technical Report to Dien Bien Agriculture Department.
- Dyrce, A. (2006) Family Muscicapidae (Old World flycatchers). Pp.148–163 in J. del Hoyo, A. Elliott & D. A. Christie, eds. *Handbook of the birds of the world*, 11. Barcelona: Lynx Edicions.
- Fuchs, J., Cibois, A., Duckworth, J. W., Eve, R., Robichaud, W. G., Tizard, T. & Gansberghe, D. V. (2007) Birds of Phongsaly province and the Nam Ou river, Laos. *Forktail* 23: 22–86.
- Hill, M., Hallam, D. & Bradley, J. (1997) *Site study; Muong Nhe Nature Reserve, Lai Chau Province, Vietnam*. SEE-Vietnam Research Report 4. London: Society for Environmental Exploration and the Institute of Ecology and Biological Resources.
- Martens, J., Eck, S., Packert, M. & Sun, Y. H. (1999) The Golden-spectacled Warbler *Seicercus burkii* – a species swarm (Aves: Passeriformes: Sylviidae). Part I. *Zool. Abh. Mus. Tierk. Dresden* 50: 281–327.
- Martens, J., Eck, S., Päckert, M. & Sun, Y. H. (2003) Methods of systematic and taxonomic research on passerine birds: the timely example of the *Seicercus burkii* complex (Sylviidae). Part 2. *Bonn. Zool. Beitr.* 51: 109–118.
- Moyle, R. G., Andersen, M. J., Oliveros, C. H., Steinheimer, F. D. & Reddy, S. (2012) Phylogeny and biogeography of the core babblers (Aves: Timaliidae). *Systematic Biology* 61: DOI:10.1093/sysbio/sys027.
- Olsson, U., Alström, P., Ericson, P. G. P. & Sundberg, P. (2005) Non-monophyletic taxa and cryptic species – evidence from a molecular phylogeny of leaf-warblers (*Phylloscopus*, Aves). *Molec. Phylog. Evol.* 36: 261–276.
- Robson, C. (2008) *A field guide to the birds of South-East Asia*. London: New Holland.
- Sodhi, N. S. & Brook, B. W. (2006) *Southeast Asian biodiversity in crisis*. Cambridge, UK: Cambridge University Press.
- Sodhi, N. S., Koh, L. P., Brook, B. W. & Ng, P. K. L. (2004) Southeast Asian biodiversity: an impending disaster. *Trends Ecol. Evol.* 19: 654–660.
- Tu, Nguyen Duc, Le Trong Trai, & Le Van Cham (2001) A rapid field survey of Muong Nhe Nature Reserve, Lai Chau Province, Vietnam. BirdLife International, European Union, FIPI.
- Vogel, C. J., Sweet, P. R., Le Manh Hung & Hurley, M. M. (2003) Ornithological records from Ha Giang province, north-east Vietnam, during March–June 2000. *Forktail* 19: 21–30.

LE Manh Hung, *Institutue of Ecology and Biological Resources, 18 Hoang Quoc Viet, Cau Giay, Hanoi, Vietnam. Email: Hungniltava@gmail.com*

Mark B. ROBBINS, *University of Kansas Biodiversity Institute, 1345 Jayhawk Blvd., Lawrence, Kansas, 66045. U.S.A.*

Nathan H. RICE, *Academy of Natural Sciences, 1900 Benjamin Franklin Parkway, Philadelphia, Pennsylvania 19103. U.S.A.*

Erick A. GARCÍA-TREJO, *Museo de Zoología 'Alfonso L. Herrera', Departamento de Biología Evolutiva, Apartado postal 70-399, México D.F. 04510, México*

Appendix

Bird species recorded in Muong Nhe Reserve, 18 March–13 April 2011

English name	Scientific name	Relative abundance	Documentation	Comments	English name	Scientific name	Relative abundance	Documentation	Comments
Rufous-throated Partridge	<i>Arborophila rufogularis</i>	U	V		Large-tailed Nightjar	<i>Caprimulgus macrurus</i>	F	S	
Scaly-breasted Partridge	<i>Arborophila chloropus</i>	F	*		Indian Nightjar	<i>Caprimulgus asiaticus</i>	R	S	
Red Junglefowl	<i>Gallus gallus</i>	U	V		Oriental Turtle-dove	<i>Streptopelia orientalis</i>	U	V,P	
Silver Pheasant	<i>Lophura nycthemera</i>	X	S		Spotted Dove	<i>Streptopelia chinensis</i>	U	S,P	
Grey Peacock-Pheasant	<i>Polyplectron bicalcaratum</i>	F	V		Barred Cuckoo-dove	<i>Macropygia unchall</i>	R	S,P	
Speckled Piculet	<i>Picumnus innominatus</i>	U	*		Emerald Dove	<i>Chalcophaps indica</i>	R	*	
White-browed Piculet	<i>Sasia ochracea</i>	U	*		Thick-billed Green-pigeon	<i>Treron curvirostra</i>	F	V,P	
Grey-capped Pygmy Woodpecker	<i>Dendrocopos canicapillus</i>	U	V,P		Mountain Imperial-pigeon	<i>Ducula badia</i>	R	S,P	
Rufous Woodpecker	<i>Micropternus brachyurus</i>	X	V		Black-tailed Crane	<i>Porzana bicolor</i>	R	S	
Greater Yellownape	<i>Picus flavinucha</i>	R	S,P		Oriental Honey-buzzard	<i>Pernis ptilorhynchus</i>	U	S,P	migrant
Grey-headed Woodpecker	<i>Picus canus</i>	R	S		Crested Serpent-eagle	<i>Spilornis cheela</i>	U	V,P	
Greater Flameback	<i>Chrysocolaptes lucidus</i>	R	S		Crested Goshawk	<i>Accipiter trivirgatus</i>	R	P	migrant
Pale-headed Woodpecker	<i>Gecinulus grantia</i>	R	V		Grey-faced Buzzard	<i>Butastur indicus</i>	U	S,P	migrant
Bay Woodpecker	<i>Blythipicus pyrrhotis</i>	F	*		Himalayan Buzzard	<i>Buteo burmanicus</i>	R	S,P	migrant
Blue-throated Barbet	<i>Megalaima asiatica</i>	F	V,P		Common Kestrel	<i>Falco tinnunculus</i>	R	S,P	
Golden-throated Barbet	<i>M. franklinii</i>	F	V,P		Chinese Pond-heron	<i>Ardeola bacchus</i>	X	S	
Oriental Pied Hornbill	<i>Anthracoceros albirostris</i>	R	V		Little Heron	<i>Butorides striatus</i>	R	S,P	
Common Hoopoe	<i>Upupa epops</i>	X	S	migrant	Silver-breasted Broadbill	<i>Serilophus lunatus</i>	F	*	
Red-headed Trogon	<i>Harpactes erythrocephalus</i>	U	*		Long-tailed Broadbill	<i>Psarisomus dalhousiae</i>	F	*	
Blyth's Kingfisher	<i>Alcedo hercules</i>	U	P		Asian Fairy-bluebird	<i>Irena puella</i>	F	V,P	
Common Kingfisher	<i>Alcedo atthis</i>	U	*		Blue-winged Leafbird	<i>Chloropsis cochinchinensis</i>	F	V,P	
White-throated Kingfisher	<i>Halcyon smyrnensis</i>	U	S,P		Orange-bellied Leafbird	<i>Chloropsis hardwickii</i>	F	V	
Crested Kingfisher	<i>Megaceryle lugubris</i>	X	S		Brown Shrike	<i>Lanius cristatus</i>	U	S,P	migrant
Blue-bearded Bee-eater	<i>Nyctornis athertoni</i>	U	P		Burmese Shrike	<i>Lanius colluriooides</i>	R	S,P	
Large Hawk-cuckoo	<i>Hierococcyx sparveriooides</i>	U	*		Long-tailed Shrike	<i>Lanius schach</i>	R	S,P	migrant
Hodgson's Hawk-cuckoo	<i>Hierococcyx nicator</i>	U	V		Grey-backed Shrike	<i>Lanius tephronotus</i>	R	S,P	migrant
Indian Cuckoo	<i>Cuculus micropterus</i>	U	V		Common Green Magpie	<i>Cissa chinensis</i>	R	V	
Eurasian Cuckoo	<i>Cuculus canorus</i>	X	V	migrant	Grey Treepie	<i>Dendrocitta formosae</i>	R	*	
Banded Bay Cuckoo	<i>Cacomantis sonneratii</i>	X	V		Large-billed Crow	<i>Corvus japonensis</i>	U	V,P	
Plaintive Cuckoo	<i>Cacomantis merulinus</i>	X	S,P		Ashy Woodswallow	<i>Artamus fuscus</i>	U	S,P	
Asian Emerald Cuckoo	<i>Chrysococcyx maculatus</i>	R	S		Maroon Oriole	<i>Oriolus trailii</i>	F	V,P	
Drongo Cuckoo	<i>Surniculus lugubris</i>	F	V,P		Large Cuckooshrike	<i>Coracina macei</i>	X	V	
Green-billed Malkoha	<i>Phaenicophaeus tristis</i>	U	V,P		Black-winged Cuckooshrike	<i>Coracina melaschistos</i>	F	V,P	
Greater Coucal	<i>Centropus sinensis</i>	U	V,P		Rosy Minivet	<i>Pericrocotus roseus</i>	C	*	migrant
Himalayan Swiftlet	<i>Collocalia brevirostris</i>	C	S,P		Ashy Minivet	<i>Pericrocotus divaricatus</i>	U	S,P	migrant
Asian Palm-swift	<i>Gypsiurus balasiensis</i>	R	S		Scarlet Minivet	<i>Pericrocotus speciosus</i>	C	V,P	
Silver-backed Needletail	<i>Hirundapus cochinchinensis</i>	F	S		Bar-winged Flycatcher-shrike	<i>Hemipus picatus</i>	U	*	
House Swift	<i>Apus affinis</i>	C	*		White-throated Fantail	<i>Rhipidura albicollis</i>	F	*	
Mountain Scops Owl	<i>Otus spilocephalus</i>	R	V		Ashy Drongo	<i>Dicrurus leucophaeus</i>	C	*	
Collared Scops Owl	<i>Otus letitia</i>	R	V,*		Bronzed Drongo	<i>Dicrurus aeneus</i>	F	*	
Brown Wood-owl	<i>Strix leptogrammica</i>	R	S		Lesser Racket-tailed Drongo	<i>Dicrurus remifer</i>	U	*	
Collared Owlet	<i>Glaucidium brodiei</i>	U	S		Spangled Drongo	<i>Dicrurus hottentottus</i>	U	S,P	
Asian Barred Owlet	<i>Glaucidium cuculoides</i>	U	V,P		Greater Racket-tailed Drongo	<i>Dicrurus paradiseus</i>	U	*	
Brown Boobook	<i>Ninox scutulata</i>	R	S		Black-naped Monarch	<i>Hypothymis azurea</i>	F	*	

English name	Scientific name	Relative abundance	Documentation	Comments	English name	Scientific name	Relative abundance	Documentation	Comments
Asian Paradise-flycatcher	<i>Terpsiphone paradisi</i>	C	*		Grey-eyed Bulbul	<i>Iole propinqua</i>	R	S	
Common Iora	<i>Aegithina tiphia</i>	U	V		Ashy Bulbul	<i>Hemixos flavala</i>	F	*	
Large Woodshrike	<i>Tephrodornis gularis</i>	U	V		Black Bulbul	<i>Hypsipetes leucocephalus</i>	F	*	
Brown Dipper	<i>Cinclus pallasii</i>	R	*		Rufescent Prinia	<i>Prinia rufescens</i>	F	*	
Blue Rock-thrush	<i>Monticola solitarius</i>	R	S	migrant	Hill Prinia	<i>Prinia supercilialis</i>	R	S,P	
Blue Whistling-thrush	<i>Myophonus caeruleus</i>	R	*		Grey-breasted Prinia	<i>Prinia hodgsonii</i>	F	*	
Lesser Shortwing	<i>Brachypteryx leucophrys</i>	U	*		Asian Stubtail	<i>Urosphena squameiceps</i>	U	*	migrant
Brown-breasted Flycatcher	<i>Muscicapa muttui</i>	U	*		Dark-necked Tailorbird	<i>Orthotomus atrogularis</i>	U	V	
Ferruginous Flycatcher	<i>Muscicapa ferruginea</i>	X	S	migrant	Common Tailorbird	<i>Orthotomus sutorius</i>	U	*	
Red-throated Flycatcher	<i>Ficedula parva</i>	U	S,P	migrant	Dusky Warbler	<i>Phylloscopus fuscatus</i>	U	V,P	migrant
White-gorgeted Flycatcher	<i>Ficedula monileger</i>	U	*		Yellow-browed Warbler	<i>Phylloscopus inornatus</i>	U	*	migrant
Snowy-browed Flycatcher	<i>Ficedula hyperythra</i>	R	*		Claudia's Warbler	<i>Phylloscopus claudiae</i>	?	*	migrant
Little Pied Flycatcher	<i>Ficedula westermanni</i>	R	*		Hartert's Warbler	<i>Phylloscopus goodsoni</i>	?	*	migrant
Slaty-blue Flycatcher	<i>Ficedula tricolor</i>	X	*	migrant	Sakhalin Leaf Warbler	<i>Phylloscopus borealoides</i>	?	*	migrant
Large Niltava	<i>Niltava grandis</i>	R	S		Yellow-vented Warbler	<i>Phylloscopus cantator</i>	R	V	
Verditer Flycatcher	<i>Eumyias thalassinus</i>	U	*		Grey-crowned Warbler	<i>Seicercus tephrocephalus</i>	?	*	migrant
Rufous-bellied Niltava	<i>Niltava sundara</i>	U	*		Bianchi's Warbler	<i>Seicercus valentini</i>	?	*	migrant
White-tailed Flycatcher	<i>Cyornis concretus</i>	F	*		Martens's Warbler	<i>Seicercus omeiensis</i>	?	*	migrant
Hainan Blue Flycatcher	<i>Cyornis hainanus</i>	C	*		Rufous-faced Warbler	<i>Abrosopus albogularis</i>	R	V	
Pale Blue Flycatcher	<i>Cyornis unicolor</i>	U	*		Yellow-bellied Warbler	<i>Abrosopus supercilialis</i>	F	V,P	
Hill Blue Flycatcher	<i>Cyornis banyumas</i>	C	*		Chestnut-capped Babbler	<i>Timalia pileata</i>	X	*	
Grey-headed Canary-flycatcher	<i>Culicicapa ceylonensis</i>	C	*	migrant	Pin-striped Tit-babbler	<i>Mixornis gularis</i>	C	*	
Yellow-bellied Fantail	<i>Chelidorhynch hypoxantha</i>	X	S		Rufous-fronted Babbler	<i>Cyanoderma ruffifrons</i>	F	*	
Siberian Rubythroat	<i>Luscinia calliope</i>	U	*	migrant	Golden Babbler	<i>Cyanoderma chrysaeum</i>	R	S	
Oriental Magpie-robin	<i>Copsychus saularis</i>	U	*		Streak-breasted Scimitar Babbler	<i>Pomatorhinus ruficollis</i>	X	S	
White-rumped Shama	<i>Copsychus malabaricus</i>	R	*		Orange-billed Scimitar Babbler	<i>Pomatorhinus ochraceiceps</i>	U	*	
White-capped Water-redstart	<i>Chaimarrornis leucocephalus</i>	U	*		Large Scimitar Babbler	<i>Megapomatorhinus hypoleucos</i>	R	V	
Plumbeous Water Redstart	<i>Rhyacornis fuliginosus</i>	U	*		Grey-throated Babbler	<i>Stachyris nigriceps</i>	F	*	
White-tailed Robin	<i>Myiomela leucura</i>	F	*		Collared Babbler	<i>Gampsorhynchus torquatus</i>	U	*	
Slaty-backed Forktail	<i>Enicurus schistaceus</i>	U	*		Rusty-capped Fulvetta	<i>Schoeniparus dubius</i>	U	S	
White-crowned Forktail	<i>Enicurus leschenaulti</i>	R	*		Puff-throated Babbler	<i>Pellorneum ruficeps</i>	U	*	
Pied Bushchat	<i>Saxicola caprata</i>	U	S,P		Spot-throated Babbler	<i>Pellorneum albiventre</i>	R	V	
Siberian Stonechat	<i>Saxicola maura</i>	U	S,P	migrant	Buff-breasted Babbler	<i>Pellorneum tickelli</i>	C	*	
Grey Bushchat	<i>Saxicola ferrea</i>	U	V	migrant	Eyebrowed Wren Babbler	<i>Napothera epilepidota</i>	U	S	
Chestnut-tailed Starling	<i>Sturnus malabaricus</i>	F	V,P		Streaked Wren Babbler	<i>Napothera brevicaudata</i>	R	*	
Chestnut-bellied Nuthatch	<i>Sitta cinnamoventris</i>	X	V		Brown-cheeked Fulvetta	<i>Alcippe poiocephala</i>	C	*	
Velvet-fronted Nuthatch	<i>Sitta frontalis</i>	U	V,P		David's Fulvetta	<i>Alcippe davidi</i>	F	*	
Japanese Tit	<i>Parus minor</i>	F	*		White-crested Laughingthrush	<i>Garrulax leucolophus</i>	F	*	
Sultan Tit	<i>Melanochlora sultanea</i>	X	V		Lesser Necklaced Laughingthrush	<i>Garrulax monileger</i>	R	V	
Barn Swallow	<i>Hirundo rustica</i>	U	S	migrant	Chinese Hwamei	<i>Garrulax canorus</i>	X	V,P	
Red-rumped Swallow	<i>Hirundo daurica</i>	U	S	migrant	Black-throated Laughingthrush	<i>Ianthocinclia chinensis</i>	U	*	
Striated Swallow	<i>Hirundo striolata</i>	C	*	migrant	Blue-winged Minla	<i>Actinodura cyanouoptera</i>	R	S	
Black-crested Bulbul	<i>Pycnonotus flaviventris</i>	U	*		Chestnut-collared Yuhina	<i>Yuhina torqueola</i>	F	V	
Red-whiskered Bulbul	<i>Pycnonotus jocosus</i>	C	*		Black-chinned Yuhina	<i>Yuhina nigrimenta</i>	U	V	
Sooty-headed Bulbul	<i>Pycnonotus aurigaster</i>	C	*		Oriental White-eye	<i>Zosterops palpebrosus</i>	R	*	
Puff-throated Bulbul	<i>Alophoxix pallidus</i>	U	*		Japanese White-eye	<i>Zosterops japonicus</i>	F	*	

English name	Scientific name	Relative abundance	Documentation	Comments	English name	Scientific name	Relative abundance	Documentation	Comments
White-bellied Erpornis	<i>Erpornis zantholeuca</i>	F	*		White Wagtail	<i>Motacilla alba</i>	F	S,P	migrant; <i>alboides</i> subspecies
Blyth's Shrike-babbler	<i>Pteruthius aeralatus</i>	F	V		Grey Wagtail	<i>Motacilla cinerea</i>	F	*	
Yellow-vented Flowerpecker	<i>Dicaeum chrysorrheum</i>	X	S		Olive-backed Pipit	<i>Anthus hodgsoni</i>	F	*	migrant
Plain Flowerpecker	<i>Dicaeum concolor</i>	C	V,P		White-rumped Munia	<i>Lonchura striata</i>	C	*	
Scarlet-backed Flowerpecker	<i>Dicaeum cruentatum</i>	F	S		Common Rosefinch	<i>Carpodacus erythrinus</i>	U	*	
Mrs Gould's Sunbird	<i>Aethopyga gouldiae</i>	R	*		Yellow-breasted Bunting	<i>Emberiza aureola</i>	X	S	migrant; 2 females, 29 March 2011
Black-throated Sunbird	<i>Aethopyga saturata</i>	F	*		Crested Bunting	<i>Melophus lathami</i>	F	V,P	
Crimson Sunbird	<i>Aethopyga siparaja</i>	F	*						
Purple-naped Sunbird	<i>Hypogramma hypogrammicum</i>	R	S						
Streaked Spiderhunter	<i>Arachnothera magna</i>	F	*						
Eurasian Tree Sparrow	<i>Passer montanus</i>	F	S						

Relative abundance criteria: C = common; more than 20 individuals/day; F = fairly common; 5-20 individuals/day; U = uncommon; present in small numbers (<5 individuals/day); R = rare; only occasionally encountered in small numbers; X = single record. Documentation: Collected = *; P = photographed; V = voice recorded; S = sight record only