Preliminary survey of the avifauna at Dong Nai Culture and Nature Reserves, Dong Nai province, Vietnam

LE MANH HUNG, MARK B. ROBBINS, NATHAN H. RICE, ERICK A. GARCÍA-TREJO, STEVEN M. ROELS & SARAH A. BODBYL-ROELS

Introduction

As a result of intense anthropogenic activity over millennia, most of the original vegetation in Vietnam has been greatly reduced. Estimates of remaining forest range between 15 and 25% (includes mangroves) and most of the extant forest is degraded (MacKinnon 1997, Sterling *et al.* 2006). Military conflicts during the 1960s and 1970s accelerated deforestation, especially in the southern half of the country, resulting in entire areas being denuded and other large swathes of natural vegetation being reduced to heavily impacted secondary forest (Sterling *et al.* 2006). Government policy in the years following the war favoured agricultural expansion and led to extensive forest loss. Instead of being allowed to recover, impacted forest was converted to cash crops or cleared to make way for people who were resettled from the north.

In southern Vietnam, the c.72,000 ha Cat Tien National Park was established to protect a number of threatened and endangered species (Tordoff *et al.* 2004), and in 2001 it was recognised as a World Biosphere Reserved Zone (UNESCO World Hertiage Center, http://whc.unesco.org). Abutting this park, a new reserve, Vinh Cuu Natural and Historical Reserve, Dong Nai province, was officially mandated in December 2003 (Tordoff *et al.* 2004). Prior to the establishment of this reserve the area had been governed by several independent entities and, as a result, different resource management regimes. Since 1997, access to the area has been controlled and there has been considerable recovery of the highly impacted lowland evergreen and lowland semi-evergreen forest. Vinh Cuu and Cat Tien are two of six protected areas within the Dong Nai River Basin Conservation Landscape that have been identified as essential for the continued existence for several species across broad taxonomic groups (Pilgrim *et al.* 2007). In July 2010, Vinh Cuu Nature Reserve was renamed Dong Nai Culture and Nature Reserves (Decision No. 2208/QD-UBND, 27 August 2010 of Dong Nai People Committee).

Herein we present preliminary results from avifaunal surveys conducted during April 2010 at two sites within Dong Nai Culture and Nature Reserves.

Study area and methods

Dong Nai Culture and Nature Reserves (hereafter Dong Nai Reserves) is c.61,625 ha and was established on 3 December 2003; it was formed primarily from the former Ma Da and Hieu Liem State Forest Enterprises (Pilgrim *et al.* 2007). The northern boundary abuts the Nam Cat Tien sector of Cat Tien National Park, which provides a critical connection of continuous forest (see Google Earth).

Within the reserves, two sites (11°22.853'N 107°03.750'E, 125 m; 11°15.896'N 106°59.265'E, 100 m), c.12 km apart, were surveyed from 5–25 April 2010. The first site was worked from 5–15 April and the second from 15–25 April. Both sites were in secondary lowland evergreen forest that was subjected to aerial bombing during the 1960s and early 1970s. Canopy height was quite variable, especially at the first site, where small patches of taller forest were interspersed with large swaths of young secondary forest. Bamboo was in scattered patches within 2–3 km of the first camp, and was the dominant vegetation a few km to the north-east of this camp. Bamboo was much less extensive at the second camp. At both, most streambeds were dry and leaf-litter was relatively deep. There was extensive cultivation (e.g. cashews) several km west of our second camp.

Mist-net effort (12 m nets, maximum of 35 nets at first site; maximum of 25 nets at second site; opened for daylight hours only) was concentrated within 2–3 km of our campsites. Daily surveys, primarily from pre-dawn to mid-morning, were made up to several km from each camp. The only precipitation during the survey was limited to a light rain for c.5–20 minutes during the afternoons of 19, 22 and 23 April. MBR's digital sound recordings are available online at the Macaulay Library (ML), Laboratory of Ornithology, Cornell University, USA. Taxonomy and nomenclature follow Inskipp *et al.* (2001), except for Black-browed Fulvetta *Alcippe grotei* and White-bellied Erpornis *Erpornis zantholeuca* where we follow Collar & Robson (2007).

Results and discussion

A total of 140 species were recorded (see Appendix). Despite the hot dry conditions, most species were vocalising; specimen data and behaviour confirmed that many species were in the initial stages of breeding. A total of 13 migrant species were recorded (see Appendix). Although we did not note the number of migrants netted/day by marking individuals, it was clear that the relative abundance of one species, Siberian Blue Robin *Luscinia cyane*, decreased during the course of our inventories. We obtained the first Cochinchina record for Brown Wood Owl *Strix leptogrammica* and documented the southernmost Vietnam record for Silver-breasted Broadbill *Serilophus lunatus*. Most noteworthy, was the prolonged observation of two adults of the rapidly declining Black-bellied Tern *Sterna acuticauda*.

We were pleasantly surprised at the diversity and abundance of phasianids at both camps; we presume this is a reflection of the prohibition of hunting since establishment of the reserve. It is possible that a fourth phasianid was present, the Orange-necked Partridge *Arborophila davidi*, but we failed to detect the species. If this partridge was present it must have been vocalising infrequently as it appears not be present in even the background of 406 MBR sound recordings made throughout the duration of our fieldwork (ML). Apparently this partridge has a very short season for calling, but it may actually have been absent in the flat relief forest that we surveyed as it may be a slope specialist (J. C. Eames *in litt.*). We also encountered three different troops (two at the first camp; one at the second), each consisting of several individuals, of the Black-shanked Douc *Pygathrix nigripes* (IUCN status Endangered) (Francis 2008). Long-tailed Macaques *Macaca fascicularis* were recorded almost daily at the first camp, with some troops numbering greater than 20 individuals. Buff-cheeked Gibbons *Nomascus gabriellae* (IUCN status Endangered) were heard at our first camp on two occasions. One small group of Asian Elephants *Elephas maximus* (IUCN status Endangered) was recorded within a few km of our first camp. Apparently Asian Black Bear *Ursus thibetanus* (IUCN status Vulnerable) is still regularly encountered (*fide* park rangers), but the last definitive Tiger *Panthera tigris* (IUCN status Endangered) record was in 1986 (park ranger, pers. comm.). Squirrel diversity and density were quite high at both camps. Several Black Giant Squirrels *Ratufa bicolor* (IUCN status Near Threatened) were observed at both camps and a single Indian Giant Flying Squirrel *Petaurista philippensis* was photographed at the second camp.

We surveyed only a small portion of the reserve and several habitats were not covered (e.g. riparian forest, agricultural areas) during our dry-season visit; thus additional surveys during other seasons are warranted to document both resident and migratory bird species that use this reserve.

Great Hornbill *Buceros bicornis*

Single individuals were seen at two sites in taller forest at our first

camp. Hopefully, with forest maturation in Dong Nai Reserves and a sizeable population in the contiguous Cat Tien National Park, this species (IUCN status Near Threatened) will recolonise the area and increase in abundance.

Black-bellied Tern *Sterna acuticauda*

On 5 April two adults in full alternate plumage were observed under a clear sky for about an hour, c.12h00–13h00, as they independently (no interaction between them being observed) flew back and forth along the length of the Tri An Reservoir within the reserve. The identification was based on the *Sterna*-like shape and proportions, white throat and upper breast and solid black mid-belly and abdomen. There appeared to be a narrow, ill-defined grey area between the upper belly and the extensive black underparts, i.e. there was not a sharp demarcation between the white and black underparts. The bills appeared orange and the caps were entirely black. At the time of the observation, LMH, who immediately made the identification, remarked on the significance of the record, and the individuals were clearly quite different in shape (e.g. being much longer-winged) and plumage from the two alternate-plumaged Whiskered Terns *Chlidonias hybrida* that were present. Because both individuals had nearly the same plumage pattern (one had some white mixed in the black belly) the possibility that birds were oiled ventrally was also eliminated.

This tern has declined throughout much of its range and its status in southern Vietnam was considered uncertain (Robson 2005). Recently it was declared extirpated as a breeder in Cambodia; the last definite nesting record occurred there when a pair hatched two chicks on a sandbar in the Sesan River, Ratanakiri province (Goes *et al.* 2010).

Brown Wood Owl *Strix leptogrammica*

A single individual was recorded at our first camp. On 12 April, a presumed male sang from c.03h00 until 03h30 (ML 163025). This same individual was heard at least a couple of other mornings prior to dawn. Apparently this represents the first record for Cochinchina (Robson 2005).

Silver-breasted Broadbill *Serilophus lunatus*

At our first camp MBR flushed an adult carrying nesting material on 10 April. The nest appeared to be nearly complete and was located c.3.5 m above the ground along a c.5 m wide secondary forest trail (photos by LMH).

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

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

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

***Erick A. GARCÍA-TREJO**, Museo de Zoología 'Alfonso L. Herrera', Department de Biología, Apartado Postal 70-399, México, D.F. 04510, Mexico.*

***Steven M. ROELS**, University of Kansas Natural History Museum and Biodiversity Institute, 1345 Jayhawk Blvd., Lawrence, Kansas 66045, U.S.A.*

***Sarah A. BODBYL-ROELS**, University of Kansas Natural History Museum and Biodiversity Institute, 1345 Jayhawk Blvd., Lawrence, Kansas 66045, U.S.A.*

Appendix

List of birds recorded in Dong Nai Culture and Nature Reserves, 5–25 April 2010

RA = relative abundance; 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. Doc = documentation; C = collected; P = photographed; S = sight record only; V = voice recorded. Status column indicates 'm' = migrant.

Species name	RA	Doc	Status
Scaly-breasted Partridge *Arborophilo chloropus*	F	V	
Red Junglefowl *Gallus gollus*	F	V, P	
Siamese Fireback *Laphura diordi*	F	P	
Germain's Peacock Pheasant *Polyplectran germaini*	U	V	
White-browed Piculet *Sosio ochroceo*	R	S	
Grey-capped Pygmy Woodpecker *Dendrocopos conicopillus*	R	V, P	
White-bellied Woodpecker *Dryacopus jovensis*	U	V, P	
Lesser Yellownape *Picus chlarolophus*	X	S	
Greater Yellownape *Picus flovinucha*	R	P	
Laced Woodpecker *Picus vittatus*	U	C, P	
Grey-headed Woodpecker *Picus canus*	U	C, P	
Common Flameback *Dinapium javonense*	U	V	

Species name	RA	Doc	Status
Greater Flameback *Chrysocolaptes lucidus*	U	V	
Bay Woodpecker *Blythipicus pyrrhotis*	R	C, P	
Black-and-buff Woodpecker *Meiglyptes jugularis*	U	V, P	
Great Slaty Woodpecker *Mulleripicus pulverulentus*	R	V	
Lineated Barbet *Megalaima lineata*	U	S	
Green-eared Barbet *Megaloima faiostricta*	F	C, P	
Blue-eared Barbet *Megaloimo oustralis*	F	V	
Oriental Pied Hornbill *Anthracaceras albirastris*	C	V, P	
Great Hornbill *Buceros bicornis*	R	S	
Orange-breasted Trogon *Horpoctes oreskios*	F	V, P	
Red-headed Trogon *Horpoctes erythrocepholus*	F	C	
Indian Roller *Coracios benghalensis*	U	V, P	
Dollarbird *Eurystomus orientolis*	R	S	
Oriental Dwarf Kingfisher *Ceyx erithacus*	F	C, P	
Banded Kingfisher *Lacedo pulchello*	F	C, P	
Ruddy Kingfisher *Holcyan coromondo*	R	P	
White-throated Kingfisher *Holcyon smyrnensis*	U	C, P	
Black-capped Kingfisher *Holcyon pileoto*	R	V	
Blue-bearded Bee-eater *Nyctyarnis athertani*	R	P	
Chestnut-winged Cuckoo *Clamotor coromondus*	X	S	
Plaintive Cuckoo *Cacamantis merulinus*	U	V	
Violet Cuckoo *Chrysacoccyx xonthorhynchus*	R	S	
Drongo Cuckoo *Surniculus lugubris*	R	V	
Green-billed Malkoha *Phoenicophoeus tristis*	F	V, P	
Greater Coucal *Centrapus sinensis*	U	V	
Lesser Coucal *Centropus bengalensis*	F	V	
Vernal Hanging Parrot *Lariculus vernalis*	U	V, P	
Red-breasted Parakeet *Psittaculo olexandri*	U	V, P	
Germain's Swiftlet *Callacolio germani*	U	S	
Silver-backed Needletail *Hirundapus cachinchinensis*	U	S	
Fork-tailed Swift *Apus pocificus*	U	S	
Collared Scops Owl *Otus bakkamaena*	F	V, P	
Spot-bellied Eagle Owl *Bubo nipolensis*	X	V	
Brown Wood Owl *Strix leptagrommica*	X	V	
Collared Owlet *Glaucidium bradiei*	R	S	
Asian Barred Owlet *Gloucidium cuculoides*	F	V, P	
Brown Hawk Owl *Ninax scutulato*	F	V	
Great Eared Nightjar *Eurostopodus macrotis*	F	V	
Indian Nightjar *Coprimulgus osioticus*	F	V	
Oriental Turtle Dove *Streptapelio chinensis*	U	S	
Emerald Dove *Cholcaphops indica*	R	C, P	
Thick-billed Green Pigeon *Treran curvirostra*	F	V, P	
Green Imperial Pigeon *Ducula aeneo*	U	V, P	
Common Sandpiper *Actitis hypaleuca*	X	S	
Red-wattled Lapwing *Vonellus indicus*	U	V, P	
Oriental Pratincole *Glareolo maldivorum*	X	S	m
Black-bellied Tern *Sterno ocuticoudo*	X	S	m

Species name	RA	Doc	Status
Whiskered Tern *Chlidanias hybrido*	X	S	m
Black Baza *Avicedo leuphotes*	X	S	m
Oriental Honey-buzzard *Pernis ptilarhynchus*	X	S	
Black Kite *Milvus migrons*	X	S	
Crested Serpent Eagle *Spilornis cheelo*	U	V, P	
Crested Goshawk *Accipiter trivirgotus*	R	P	
Shikra *Accipiter badius*	X	V, P	
Besra *Accipiter guloris*	R	P	
Collared Falconet *Microhierax coerulescens*	R	S	
Grey Heron *Ardeo cinerea*	X	S	
Purple Heron *Ardea purpurea*	X	S	
Lesser Adjutant *Leptoptilas jovonicus*	X	S	
Blue-rumped Pitta *Pitta sarar*	U	P	
Bar-bellied Pitta *Pitta elliotii*	F	V	
Blue-winged Pitta *Pitta maluccensis*	X	P	m
Dusky Broadbill *Corydan sumatronus*	U	V	
Black-and-red Broadbill *Cymbirhynchus macrarhynchas*	U	P	
Banded Broadbill *Eurylaimus javanicus*	F	V, P	
Silver-breasted Broadbill *Serilophus lunatus*	X	P	
Blue-winged Leafbird *Chloropsis cochinchinensis*	F	V, P	
Golden-fronted Leafbird *Chlorapsis ourifrons*	F	V	
Brown Shrike *Lonius cristotus*	R	S, P	m
Indochinese Green Magpie *Cisso hypoleuco*	U	C	
Rufous Treepie *Dendrocitta vogobundo*	X	S	
Racket-tailed Treepie *Crypsirina temia*	U	P	
Dark-throated Oriole *Oriolus xanthanotus*	U	V	
Large Cuckooshrike *Caracina macei*	R	V	
Black-winged Cuckooshrike *Caracina melaschistas*	R	V	
Scarlet Minivet *Pericracatus flommeus*	F	V	
Bar-winged Flycatcher-shrike *Hemipus picatus*	U	P	
Ashy Drongo *Dicrurus leucophoeus*	F	V	
Bronzed Drongo *Dicrurus aeneus*	F	V, P	
Spangled Drongo *Dicrurus hottentottus*	R	S	
Greater Racket-tailed Drongo *Dicrurus paradiseus*	C	C	
Black-naped Monarch *Hypothymis azurea*	C	C	
Asian Paradise-flycatcher *Terpsiphane poradisi*	F	C, P	
Common Iora *Aegithino tiphio*	U	V	
Great Iora *Aegithino lofresnoyei*	F	V, P	
Large Woodshrike *Tephradarnis gularis*	U	V	
White-throated Rock Thrush *Manticala gularis*	U	C, P	m
Orange-headed Thrush *Zoothero citrino*	X	S	m
Asian Brown Flycatcher *Muscicopo douurico*	U	S	m
Red-throated Flycatcher *Ficedula parva*	R	S	m
Blue-throated Flycatcher *Cyornis rubeculoides*	X	C	
Tickell's Blue Flycatcher *Cyornis tickellioe*	F	C	
Siberian Blue Robin *Luscinio cyane*	F	C	m
White-rumped Shama *Capsychus moloboricus*	F	C, P	

Species name	RA	Doc	Status
Golden-crested Myna *Ampeliceps coronotus*	R	P	
Hill Myna *Groculo religioso*	R	S	
Velvet-fronted Nuthatch *Sitto frontolis*	U	P	
Black-crested Bulbul *Pycnonotus melonicterus*	F	C	
Stripe-throated Bulbul *Pycnonotus finlaysoni*	F	C, P	
Yellow-vented Bulbul *Pycnonotus goiovier*	R	S	
Streak-eared Bulbul *Pycnonotus blonfordi*	U	P	
Ochraceous Bulbul *Alophoixus ochroceus*	F	C, P	
Grey-eyed Bulbul *Iole propinquo*	F	C, P	
Rufescent Prinia *Prinio rufescens*	U	V	
Common Tailorbird *Orthotomus sutorius*	F	V	
Dark-necked Tailorbird *Orthotomus otroguloris*	U	V	
Radde's Warbler *Phylloscopus schworzi*	X	S	m
Greenish Warbler *Phylloscopus trochiloides*	F	C	m
White-crested Laughingthrush *Gorrulox leucolophus*	F	C, P	
Lesser Necklaced Laughingthrush *Gorrulox monileger*	U	S	
Abbott's Babbler *Molococinclo obbotti*	F	C, P	
Buff-breasted Babbler *Pellorneum tickelli*	F	C	
Puff-throated Babbler *Pellorneum ruficeps*	F	C	
Scaly-crowned Babbler *Molocopteron cinereum*	F	C, P	
Large Scimitar Babbler *Pomotorhinus hypoleucos*	U	P	
Striped Tit Babbler *Mocronous guloris*	F	C	
Grey-faced Tit Babbler *Mocronous kelleyi*	F	C, P	
Black-browed Fulvetta *Alcippe grotei*	F	C, P	
White-bellied Erpornis *Erpornis zontholeuco*	F	C	
Yellow-vented Flowerpecker *Dicoeum chrysorrheum*	X	S	
Scarlet-backed Flowerpecker *Dicoeum cruentotum*	U	S	
Ruby-cheeked Sunbird *Anthreptes singolensis*	U	C, P	
Purple-naped Sunbird *Hypogrommo hypogrommicum*	F	C, P	
Purple-throated Sunbird *Nectorinio speroto*	F	V	
Olive-backed Sunbird *Nectorinio juguloris*	F	V	
Crimson Sunbird *Aethopygo siporojo*	F	P	
Little Spiderhunter *Arochnothero longirostro*	F	C, P	
Richard's Pipit *Anthus richordi*	X	P	

Predation by leopards of Black-necked Cranes *Grus nigricollis* in Bhutan

TSHERING CHOKI, JIGME TSHERING, TSHEWANG NORBU, UTE STENKEWITZ & JAN F. KAMLER

Introduction

The Black-necked Crane *Grus nigricollis* is classified as Vulnerable by IUCN, owing to its single small and declining population (BirdLife International 2009). Population declines are thought to be due to loss of wetland habitat and agricultural changes in both its breeding and wintering grounds (BirdLife International 2009). Breeding grounds occur mainly in the Qinghai–Tibetan plateau, China, with small populations in adjacent areas. Wintering grounds primarily include southern Tibet and the Yunnan–Guizhou plateau in China, and Bhutan (BirdLife International 2009).

Owing to the high elevation, remoteness and low human population in most of its range, little is known about the ecology of the Black-necked Crane. Although interest and research has increased recently on the species (Lhendup & Webb 2009, Liu *et al.* 2010), virtually nothing is known about its natural predators, especially for adult birds. In Ladakh, India, free-ranging dogs *Canis familiaris* and Common Ravens *Corvus corax* were identified as major predators of eggs and chicks (BirdLife International 2001). Although no predators of Black-necked Cranes have been identified in China, potential predators were thought to be raptors, Common Ravens, domestic dogs, foxes *Vulpes*, Eurasian lynx *Lynx lynx*, wolves *Canis lupus* and bears *Ursus* (Dwyer *et al.* 1992). In Bhutan, natural predators were thought to be jackals *Canis aureus* and red foxes *Vulpes vulpes*, although this was never confirmed (Dorji 1987).

In other crane species, predation on eggs and chicks by a variety of mammal species is commonly reported (Desroberts 1997, Ivey & Scheuering 1997, Bergeson *et al.* 2001), although predation on adult cranes is rarely reported. However, for the Critically Endangered Whooping Crane *Grus americana* predation on juveniles and adults was so severe in some populations that it significantly inhibited recovery efforts (Nesbitt *et al.* 2001). Therefore, identification of predators of adult Black-necked Cranes is important: not only to gain better insights into their ecology, but also to assist conservation efforts that aim to increase long-term populations. In Phobjikha Valley, Bhutan, predation on adult cranes was reported as far back as the 1980s (BirdLife International 2001), although predation seemed to increase in recent years. From 2007 to 2010, ≥5 cranes per winter were killed by mammalian predators, although their identity was not established. Based on previous literature, we thought domestic dogs would be the most likely predator, although several local villagers we interviewed suggested that leopards *Panthera pardus* killed cranes. Our goal was to decrease predation events, but we first needed to identify the predatory species in order to implement preventative measures. Here we provide data that confirmed leopards kill adult Black-necked Cranes in Bhutan, and discuss the implications of this for crane conservation.

Methods

The Phobjikha Valley is located in west-central Bhutan (27°23–30'N 90°10–14'E). Altitude ranges from 2,800 m a.s.l. on the valley floor to 4,000 m on the surrounding mountaintops. Vegetation on the valley floor consists of pastureland dominated by dwarf bamboo *Yushania microphylla*, whereas the surrounding mountains consist of coniferous forests dominated by blue pine *Pinus wallichiana*. The valley contains the largest population (c.300) of wintering Black-necked Cranes in Bhutan, with a large part of the area protected in the Phobjikha Conservation Area (163 km^2). Our research focused in the northern part of the valley floor, which contained a large roosting site of c.100 cranes during the study. The distance from the edge of the roost to the closest forest edge was 100 m.

The Black-necked Cranes were monitored regularly by staff of the Royal Society for Protection of Nature, which manages the conservation area. Cranes were observed using spotting scopes several times per week before they left the roost in the morning. If feathers or carcasses were observed after cranes have left the roost, researchers walked out to the roost to collect remains and record evidence. All dead cranes appeared to have been killed by a