Acknowledgements

We thank the Ministry of Environment and Forest India for funding our project, the forest department of Andaman and Nicobars for their practical help and staff at SACON for other support.

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***Natarajan EZHILARASI**, Sálim Ali Centre for Ornithology and Natural History, Anaikatty, Coimbatore, Tamil Nadu, India. Email: ezhilarasinatarajan@gmail.com*

***Lalitha VIJAYAN**, Sálim Ali Centre for Ornithology and Natural History, Anaikatty, Coimbatore, Tamil Nadu, India.*

A newly described call and mechanical noise produced by the Black-and-crimson Pitta *Pitta ussheri*

TERESA M. PEGAN, JACK P. HRUSKA & JUSTIN M. HITE

Introduction

The Black-and-crimson Pitta *Pitta ussheri* is endemic to Sabah, Malaysia. It inhabits lowland rainforests from sea level to 300 m and is often found in dense undergrowth (Erritzoe 2003). It is tolerant of disturbance and can sometimes be found in selectively logged areas and overgrown plantations (Lambert & Woodcock 1996). Nonetheless, the species is classified as Near Threatened because of high rates of lowland deforestation and habitat loss (BirdLife International 2012).

The primary call of the Black-and-crimson Pitta has been well documented. Lambert & Woodcock (1996) describe it as 'a prolonged, relatively quiet whistle that gradually rises in power and pitch and then suddenly stops'.

Two previously undescribed sounds produced by the Black-and-crimson Pitta are documented here: a presumed mechanical noise (sonation) and a call similar to one produced by the Blue-headed Pitta *Pitta baudii* and hereafter referred to as the '*baudii*-like call'.

The observations were made between 27 June and 27 July 2012 at Tawau Hills Park, Sabah. The pittas occupied two different low (about 250 m) swampy areas of primary dipterocarp rainforest, each within 1 km of the park headquarters (4.399°N 117.889°E). How many pittas were in these areas was not determined.

Novel sounds

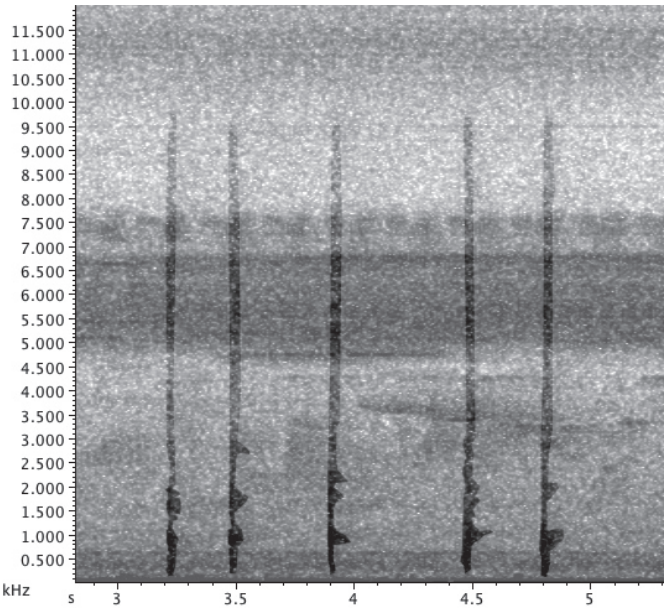
Sonation

A recording of this sound can be found at http://macaulaylibrary.org/audio/169900, whilst video recordings of the bird perched and calling, then flying away and producing the sound off-camera, can be seen at http://macaulaylibrary.org/video/471600 and http://macaulaylibrary.org/video/471609. This sonation sounds like a series of soft claps or pops.

In the recording, the mean frequency range of each of the five claps was 85 Hz to 9.7 kHz, and the duration of each clap was 0.1 second or less. Hereafter the noise is referred to as a non-vocal sonation, although this has not been confirmed conclusively.

The species was first seen making this sonation on 27 June 2012, when JMH encountered a Black-and-crimson Pitta after playing back this species's song. When the bird was found it was perched about 4 m up in a tree, where it sang at regular intervals. After about 10 minutes, JMH moved closer and the bird became slightly agitated but continued to call. It then flew to the ground and produced the sonation as it flew from tree to ground. It was unclear whether the presence of the observer had any effect on the behaviour of the bird.

Figure 1. The sonation. Each dark vertical bar represents one sonation. The horizontal band between 4.5 and 8 kHz is the result of background insect noise. This spectrogram was produced by Raven software using the same recording linked below. Recording by Justin Hite. Because of the quality of the recording, the sonations have been artificially highlighted with Photoshop for clarity.



Spectrogram parameters:
Type: Hann
Window size: 2762 samples
Overlap: 70%
Hop size: 829 samples
DFT: 8192 samples

The sonation was documented (i.e. recorded or described in written field notes) six times between 27 June and 27 July 2012, it was also observed regularly without being documented. Five of the six documented observations occurred in one general area, but birds in a different area were also observed to produce the sound. In every case, the sound was made as the bird left a perch from which it had been calling continuously for some time. In three observations, the bird left the perch, made the sonation as it flew, and then landed on a different tree where it resumed calling; in the other three observations the bird made the sonation as it flew to the ground. Pittas were also regularly observed flying from perch to perch and from perch to ground without producing the sound. The pulse interval of the sound was consistent with the rate of flapping observed when pittas were seen in flight.

Baudii-like call

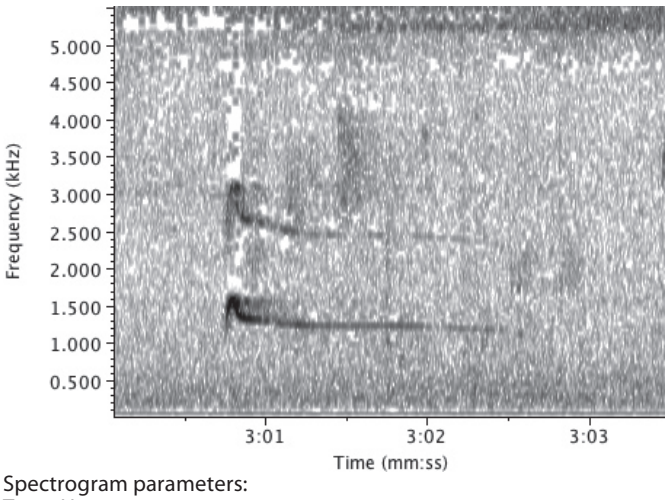
A recording of this call can be found at http://macaulaylibrary.org/audio/171509. This Black-and-crimson Pitta call is similar to the female alarm call of the Blue-headed Pitta, described as *hwee-oo* (Lambert & Woodcock 1996, Erritzoe 2003), as demonstrated in Figures 2 & 3. The Black-and-crimson Pitta call tends to be longer in duration than that of the Blue-headed Pitta; the average duration of 32 Black-and-crimson Pitta calls in the recording (calls made by one individual) was 1.7 seconds, compared to an average of 0.8 seconds for 36 Blue-headed Pitta calls measured (seven individuals).

The fundamental frequency of the Black-and-crimson Pitta call ranges from about 1.1 kHz to 1.7 kHz, and the average fundamental frequency of the Blue-headed Pitta call ranges from about 0.98 kHz to 1.6 kHz.

This call was heard on only two occasions, both times by JMH. On 9 July 2012 at around 16h00 he heard a Black-and-crimson Pitta calling and began playback. The pitta responded with the undescribed call and he was able to get close enough to record the call on his iPhone about 10 minutes later. The bird gave the call frequently and regularly, calling 42 times (at a rate of about once every 8 seconds) during the seven-minute recording. Another Black-and-crimson Pitta was calling nearby and later a second pitta was flushed.

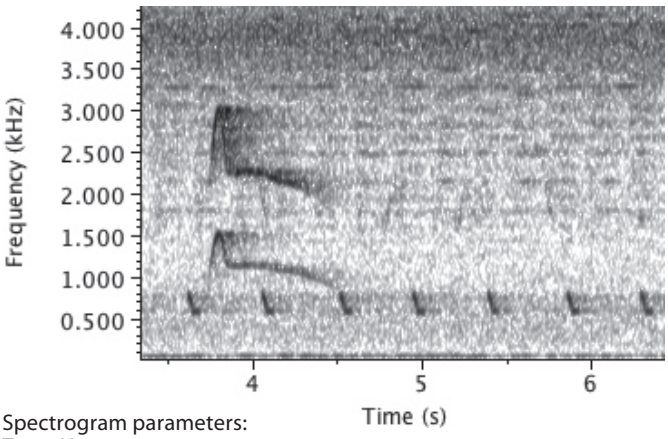
On the second occasion in the same area at about 16h00 on 15 July 2012, two Black-and-crimson Pittas were heard calling from different directions. The two birds approached each other over the next 15 minutes until they were about 10 m apart. Then one flew toward the other, making the sonation described above 2–3 times. The pittas were not visible at this point but soft, low warblings were heard from their estimated location. One bird flushed as the observer moved closer and the other bird gave the novel call three times and then hopped away. Both birds were seen briefly and appeared to be adult Black-and-crimson Pittas.

Figure 2. *Pitta ussheri* call. The spectrogram was produced by Raven software using the same recording linked above. Recording by Justin Hite.



Spectrogram parameters:
Type: Hann
Window size: 1000 samples
Overlap: 90%
Hop size: 100 samples
DFT: 1024 samples

Figure 3. *Pitta baudii* call. This spectrogram, was produced by Raven software using ML Audio 164150 (http://macaulaylibrary.org/audio/164150). The signals occurring between 0.5 and 1 kHz are background noise. Recording by Martjan Lammertink.



Spectrogram parameters:
Type: Hann
Window size: 1466 samples
Overlap: 90%
Hope size: 147 samples
DFT: 2048 samples

Discussion

Sonation

A sonation is a 'nonvocal acoustic signal' and evidence suggests that sonations are made by a wide variety of birds and may be more common than previously realised (Bostwick 2006). There is little literature on sonations in Old World suboscines, although mechanical noises have been described in many of the African suboscines, including members of Calyptomenidae and Philepittidae (Lambert & Woodcock 1996). Chapin (1953) noted that both the African Pitta *Pitta angolensis* and the Green-breasted Pitta *P. reichenowi* give a mechanical *prrrt* during short upward flights, which he believed to be produced by the wings.

In this case, the presumed sonation was always made when birds were flying quickly through dense vegetation, and direct visual observation was impossible. However, every time the sound was made the bird was in mid-flight, leading to the hypothesis that the noise is a nonvocal sound produced by movements of the bird's wings. Although we did not obtain definitive evidence that the clapping sound made by the bird is a sonation, it seems reasonable to assume that the sound is produced nonvocally, given the behavioural context and that the pulse interval of the sounds produced are consistent with passerine wing noise. We are unaware of any specialised morphology pertaining to the Black-and-crimson Pitta for this sort of sound production. It may be produced by a whole-wing movement, perhaps similar to that used by Rock Doves *Columba livia* when producing alarm sonations (Daanje 1950).

This sound is not produced every time the bird flies, which suggests that it is voluntary, meaning that it could be a signal although its meaning is unknown. Although the sonation was first heard when the bird was possibly alarmed, Black-and-crimson Pittas were flushed on many occasions without the sonation being heard. Most sonations occurred after the bird had been under observation for 10 or more minutes, suggesting that the noise is not related to the bird being alarmed by human presence. Because it was made consistently at times when the bird was calling from a perch, it may be related to breeding/ territorial behaviour.

Call

On the two occasions the *baudii*-like calls were heard more than one Black-and-crimson Pitta was present, suggesting some conspecific interaction e.g. a territorial border dispute.

Whether male pittas alone or both males and females call apparently has not been documented. If both sexes call, then the two birds approaching in the second observation could have been a pair, and the call could be related to courtship or pair bonding. Also, because of the time of year, the earlier incident on 9 July 2012 could have been related to interaction between a parent and a nearly fully-grown juvenile.

Acknowledgements

The observations above were made by members of an Ivy Expedition (a group of Cornell University undergraduate and graduate students participating in a Cornell Expedition in Field Ornithology [CEFO]). We are especially grateful to Marybeth Sollins, founder and benefactor of the Ivy Expedition Fund, who provided funds to support this expedition. This is CEFO's first publication. Thanks go to our fellow expedition members, Julian Kapoor, McKenna Kelly, Drew Fulton, Daniel Gu, Sophie Orzechowski, and Brian Magnier. We also thank Maklarin bim Lakim, the staff of Tawau Hills Park, Kim Bostwick, Ann Warde, Fred Sheldon, and our expedition advisor David Winkler.

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Teresa M. PEGAN, Jack P. HRUSKA *and* ***Justin M. HITE****, Cornell Expeditions in Field Ornithology, Cornell Universtity Museum of Vertebrates and Labratory of Ornithology, 159 Sapsucker Woods Road, Ithaca NY 14850 USA. Emails: tmp49@cornell.edu, jph239@cornell.edu, justinhite@gmail.com Website: http://cefo.cornell.edu*

White-shouldered Ibis *Pseudibis davisoni* population size and the impending threat of habitat conversion

HUGH L. WRIGHT, SOK KO, NET NORIN & SUM PHEARUN

Introduction

Cambodia boasts a rich diversity of large-bodied waterbirds and harbours globally significant populations of several threatened ibises and storks, and a crane (Critical Ecosystem Partnership Fund 2012). While the future of these species remains perilous, recent research has advanced understanding of their ecology and enhanced conservation responses (Keo 2008, van Zalinge *et al.* 2011, Wright 2012, Clements 2013). Greater search effort, collaborative and nationwide monitoring (White-shouldered Ibis Conservation Group 2012, Wright *et al.* 2012b) and species-specific research (Wright 2012) have improved knowledge of the White-shouldered Ibis *Pseudibis davisoni*.

This species was once widespread in South-East Asia but, following a decline in the twentieth century, is now confined to Cambodia and tiny areas of southern Laos and east Kalimantan, Indonesia (BirdLife International 2013). In 2000 the species was classified as Critically Endangered (BirdLife International 2001), with an estimated global population of fewer than 250 mature individuals. Since 2009 birds have been counted at wet-season roosts in Cambodia and in 2010 these revealed a minimum national population of 523 individuals (Wright *et al.* 2012b).

Conversion of habitat to agriculture is one of the greatest threats to the species (White-shouldered Ibis Conservation Group 2012) and to much of Cambodia's globally important forests and grasslands (Critical Ecosystem Partnership Fund 2012). Government land in Cambodia is classified into state public (land for public interest or use) and state private (not for the public and available for private purchase) property. The leasing of both types for economic development through various legal concession mechanisms, particularly as Economic Land Concessions (ELCs), is now the major driver of agricultural expansion in Cambodia (Poffenberger 2009). ELCs are leased to private companies for up to 99 years, and habitats are converted to the industrial-scale cultivation of commodity or energy crops, such as rubber, cassava, sugarcane and jatropha (Sukkasi *et al.* 2010, Open Development Cambodia 2013a). While many concessions have not yet commenced cropping, publicly available data (Open Development Cambodia 2013b) suggest that more than 2 million ha of ELCs have already been granted. Despite their scale, very few studies have quantified the potential impact of ELCs on threatened species.

This paper reports the latest White-shouldered Ibis censuses in 2011 and 2012, combining roost counts with supplementary data to revise estimates of the Cambodian and global populations. Comparison of the distribution of ELCs and roosting White-shouldered Ibis starkly highlights the imminent threat that the concessions pose to the species.

Methods

The White-shouldered Ibis is a solitary breeder in the dry season (November–April) but gregarious in the wet season (May–October), gathering to roost in tall dipterocarp trees in dry deciduous forest or on river-channel islands (Wright *et al.* 2012a). The species often shows roost fidelity, using many communal roosts repeatedly in both seasons and from year to year. To improve population estimates, White-shouldered Ibis were counted simultaneously at known roosting sites in the 2011 and 2012 wet seasons. Counts were made in five study areas: Kulen Promtep Wildlife Sanctuary, Lomphat Wildlife Sanctuary, Mekong Flooded Forest, Mondulkiri Protected Forest and Western Siem Pang Important Bird Area (Figure 1). Counts have been made here since 2009 (Wright *et al.* 2012b), with the exception of Mondulkiri where counting began in 2012.

Roost sites were located by local people and occasional active searching by field staff. Without doubt some roosts are still to be discovered: few sites were known before 2009, and the study area was large—more than 13,300 km^2. Total counts therefore provide minimum estimates of population size. The number of roosts surveyed in each study area (Table 1) probably varied due to both the differing capacities of local organisations and the size of the White-shouldered Ibis population in the area. However, knowledge of roost site locations improved with time so that the 32 sites surveyed in 2009 had risen to 68 in 2012. To improve accuracy,