

Breeding behaviour and nesting ecology of White-browed Shortwing *Brachypteryx montana* in Nepal

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Opportunistic observations of White-browed Shortwing *Brachypteryx montana* breeding clusters were made at two sites in Makalu-Barun National Park and Buffer Zone, Nepal on 7–11 May 2000 and 16–20 June 2002. Nesting birds gave distinctive displays that apparently serve to distract potential predators from the nest. At least two (presumably subadult) males were observed breeding in a brown, female-like plumage. Nest structure varied: one was a large woven orb of bamboo leaves and moss containing a lined cup and lateral entrance; two others had only a top entrance and were suspended in understorey vegetation, and a fourth was recessed in the mossy base of a shrub.

INTRODUCTION

White-browed Shortwing *Brachypteryx montana* is widely distributed in moist montane forests of southern Asia, reportedly occurring from Simla (Himachal Pradesh) and Garhwal (Uttaranchal) in India (Baker 1924 [but regarded as questionable sight records, Roonwal and Nath 1947]), central Nepal (Grimmett *et al.* 1998), through the eastern Himalayas to north-east India, Myanmar and the northern regions of Thailand, Laos and Vietnam, plus south-east

Tibet and southern China to Taiwan and the Philippines (Robson 2000). To the south, there is a gap in distribution as far as the Greater Sundas. On Borneo, the only records of the species are from Mt Kinabalu and nearby peaks in Sabah (Smythies 1986, Davison 1992) and the Mt Mulu area of Sarawak (Harrison 1963). White-browed Shortwing is also reported from Sumatra and Java (MacKinnon and Phillipps 1993), with an isolated subspecies on Flores in the Lesser Sundas (White and Bruce 1986, Robson 2000).

In the Himalayas, subspecies *B. m. cruralis* is an altitudinal migrant, wintering at lower temperate and subtropical elevations down to 245 m (Inskipp and Inskipp 1991) and breeding in temperate forests up to 3,660 m (Grimmett *et al.* 1998). At Paha Khola in east Nepal, Martens and Eck (1995) found the species as late as June limited to a zone of 2,400–2,700 m in mixed broadleaf forests, mainly brown oak *Quercus semecarpifolia* and Himalayan hemlock *Tsuga dumosa*. Males breed in two plumages: blue and female-like brown (Plate 1 and cover).

The status of the species over much of its range is difficult to assess because of the bird's typically shy and unobtrusive behaviour in dense undergrowth. Abundance estimates in Nepal range from very common (Ali and Ripley 1997) to fairly common (Fleming *et al.* 1984) and very uncommon (Inskipp and Inskipp 1991, Grimmett *et al.* 1998, 2000).

Knowledge of the breeding biology, ecology and conservation requirements of this secretive species is relatively sparse. Herein I report observations recorded during two treks to Makalu-Barun National Park and Buffer Zone (MBNP; MBBZ) in eastern Nepal.

RESULTS

While ascending the west bank of the Ishuwa river valley in MBNP 7–12 May 2000, seven male and two female White-browed Shortwings were encountered at 2,650–3,170 m in pristine, temperate, mixed broadleaf forest, comprising maple *Acer* spp., rhododendron *Rhododendron* spp. and *ningalo* *Drepanostachyum* spp. and *malingo* *Yushania maling* bamboos, with secondary elements of hemlock, yew, magnolia and camellia (Table 1). Most (n=6) of the birds were found at 2,790–2,940 m within 1.9 km of Dzo Kharka (= meadow) 27°38'N 87°11'E.

A similar cluster of birds was encountered on 16, 17 and 20 June 2002 on the upper slopes of Tham Danda 27°31'N 87°03'E in MBBZ (Table 1). This temperate forest spur forms the watershed between the lower



Plate 1. White-browed Shortwing males (upper two birds) and female (lower bird); see also cover.

Table 1. White-browed Shortwing records from Makalu-Barun National Park and Buffer Zone, east Nepal. Altitude estimated from GPS coordinates taken at or near observation sites (± 20 m accuracy).

Individuals	Date	Site	Altitude (m)
Singing ♂	7 May 2000	Kardi Khola <i>kharka</i> edge	2,650
Singing blue ♂	8 May 2000	Edge of Dzo Kharka, Ishuwa Khola	2,940
Nesting blue ♂♀	8 May 2000	SW of Dzo Kharka, Ishuwa Khola	2,935
Nesting blue ♂♀	9 May 2000	NE of Dzo Kharka, Ishuwa Khola	2,885
Singing blue ♂	9 May 2000	NE of Dzo Kharka, Ishuwa Khola	2,805
Nesting blue ♂	9 May 2000	NE of Dzo Kharka, Ishuwa Khola	2,790
Singing ♂	9 May 2000	NE of Dzo Kharka, Ishuwa Khola	2,810
Brown ♂	11 May 2000	kharka (name unknown), Ishuwa Khola	3,170
Breeding blue ♂♀	16 June 2002	SW Tham Danda, Sisuwa Khola	2,800
Singing ♂	16 June 2002	SW Tham Danda, Sisuwa Khola	2,850
Singing blue ♂	17 June 2002	SW Tham Danda, Sisuwa Khola	2,810
Singing ♂	17 June 2002	SW Tham Danda, Sisuwa Khola	2,780
Singing ♂	19 June 2002	Tham Danda top, Sisuwa Khola	2,890
Breeding brown ♂ feeding immature	20 June 2002	NE Tham Danda, Sisuwa Khola	2,695
Nesting blue ♂♀	20 June 2002	NE Tham Danda, Sisuwa Khola	2,705
Blue ♂	20 June 2002	NE Tham Danda, Sisuwa Khola	2,680

Sankhuwa and lower Sisuwa kholas, about 18 km from the Ishuwa location. At least three pairs were observed at 2,695–2,810 m in cut-over mixed broadleaf forest comprising maple, *Michelia champaca*, oaks *Quercus lamellosa* and *Q. semecarpifolia*, with a heavily thinned understorey of patchy *ningalo*, broadleaf saplings and tall ferns.

Behaviour

At Ishuwa Khola, three males were observed displaying agitatedly near their nests or presumed nest sites. The male at the first nest was flushed 8 m to the edge of a *malingo* clump. It perched partially obscured on a fallen stalk c. 15 cm above the ground, faced me, and displayed its tail. With the tip of the tail pointed downwards, the feathers were splayed in a tilted arc, resembling the opening of a warped hand fan, and were held motionless for c. 15 seconds (Plate 1). This behaviour recalled the tail-flaring behaviour of other muscicapids, e.g. White-capped Water Redstart *Chaimarrornis leucocephalus*, Blue Whistling Thrush *Myophonus caeruleus*, and to a lesser degree, White-tailed Robin *Myiomela leucura*. The shortwing then made low agile flights around the *malingo* base, pausing to flick its wings repeatedly while emitting a hard *tock* contact note at 10–20 second intervals.

The male at the second nest was bolder and even more agitated than the first, giving *tock* calls at a similar rate, but mainly as a double note while hopping along fallen bamboo, apparently to distract me from the nest. The less conspicuous female behaved similarly, halting after each progression on the forest floor until I approached to within 4–5 m, and once backtracked towards me when I did not follow. Both birds flicked their wings at 3–5 second intervals, usually preceded in the male by a robin-like, grating alarm call, rendered as *tt-tt-tt-tt* by Lister (1954). Subsequently, the male was observed dashing adroitly and sleekly through the undergrowth, mostly along fallen canes, and without flicking its tail or wings, very similar to the ‘running like a rat’ behaviour observed by Rippon (1901) in Burma and Ali (1962) in Sikkim. It halted briefly on a bamboo cane to give bursts of wing-flicking in unison with

depressing and fanning of its tail. The male next perched in full view c. 15 cm above the ground, stretched towards me, and proceeded to bob its head up and down in 3–12 second bouts. Moments later there followed a bizarre sequence of uniformly deep, downward jerks of its head, then a simultaneous combination of depressed tail-fanning, wing-flicking, and while leaning farther forward below the horizontal, slow twisting of its head to one side, then the other.

Another blue male was encountered giving alarm calls and parts of its song, in particular the initial wheezy notes as noted by Robson (2000), and ‘odd sucking and popping noises’ as characterised by Smythies (1986). This male also dashed rapidly along fallen bamboo, and exhibited similar wing-flicking with tail-flaring. A third blue male carrying nesting material gave *tock tock* and wheezy calls, and a short, highly oscillating warble. When not singing the bird flicked both its wings and tail, or alternately fanned its tail outwards without wing-flicking.

A brown-plumaged male was observed singing from the ground with drooped wings and raised tail, similar to the in-song behaviour reported for Rusty-bellied Shortwing *B. hyperythra* (Mauro and Verccruysse 2000), and flicked its wings and tail in unison at rest. At Tham Danda, a brown breeding male gave a more rudimentary display, occasionally fanning but not dipping its tail, and alternating this with wing-flicking. A weak scolding *cheep...cheep* was uttered, sometimes slowing to a softer *chileep...chileep*. A soft *tick...tick* call was also given, lacking the hard quality of the blue male *tock* calls. A breeding female also gave similar calls. Two other vocalising blue males were seen wing-flicking, tail-fanning and tail-dipping, while emitting hard *tick...tick* calls.

Plumage

When agitated, the supercilium in blue males was flared, appearing wider and more rectangular than normally observed or depicted (e.g. Fleming *et al.* 1984, Grimmett *et al.* 1998), and tapering at the back of the eye rather than extending into the nape as illustrated by Ali and Ripley (1995; 1997) and King *et al.* (1975) (Plate 1).

The supercilium on a brown male observed at 3 m range on Tham Danda was neatly squared-off at the forehead, extended higher above the eye, and tapered into the nape (Plate 1). The white supercilium of brown males readily separates them from otherwise similarly plumaged females. Ali (1962) stated that brown males show more chestnut on the wings and tail compared to females. This could not be determined for the male in the Ishuwa, which was seen in suboptimal light. However, a distinctly rufescent tail was noted on the brown male at Tham Danda. Rufescent wings and tail are evident in the two female skins in the Smithsonian Institution (NMNH), and in 22 out of 24 females examined at the Natural History Museum, Tring (BMNH). However, only eight out of 19 brown males at BMNH show a rufescent wash, and in six of these the wash is noticeably reduced in intensity compared to females (personal observation). Robson (2000, 2002) noted that the lores of brown *B. m. cruralis* males are darker than in females. This difference could not be determined in the field, but is apparent in NMNH specimens (personal observation).

Nesting

Two active nests were found near Dzo Kharka (2,940 m). The first was built on a very steep slope ($>60^\circ$) c.20 m from the meadow in a heap of fallen, mostly dead *malingo* canes, on mossy maple branches (Plates 2–3). The site was in open maple-rhododendron forest (mainly *Acer campbellii* and *Rhododendron arboreum*), with an understorey dominated by dense bamboo clumps interspersed with thin patchy ground cover of short shrubs, herbs and ferns. The nest was a cone-shaped woven structure of dried leafy *malingo* twigs and maple leaves, 43 cm in length, 3 cm above the ground, recessed and suspended in canes and branches, camouflaged and well-hidden from view. The entrance was at the top, directly over the cup, and obscured by canes, drooping strands of moss, and leaf litter. A lateral entrance, as mentioned by several authors (Oates 1889, Baker 1933, Ali 1962, Ali and Ripley 1997, Robson 2000) was not present. The cup was 12 cm deep, 11 cm wide at the rim, and lined with green moss and a single birch *Betula utilis* leaf. Three eggs inside were opaque white, tinged pink and deduced to have been freshly laid. Egg-colour has previously been reported as 'pure white' (Oates 1889, Osmaston 1904) and 'white' (Ali and Ripley 1973). The nest was attended by a pair, with the female incubating on 8 and 9 May 2000.

The second nest was found at about the same altitude c.80 m to the west in dense *malingo* along an overgrown trail. Nest composition and structure was different, consisting mainly of green moss but loosely interwoven (particularly on the exterior) with thin strands of dead, leafy *malingo* twigs and dried moss (Plate 4). The mossy egg chamber was more deeply recessed (depth=19 cm), and lined in the bottom with small *malingo* leaves and fern roots, but otherwise empty. The outer bamboo and moss stitching formed a sheath around the egg chamber, extending as a cone 15 cm above the rim and tapering below the rim c.30 cm to the nest base. A lateral entrance was located adjacent to the egg chamber. The nest was built on three bent overlapping bamboo canes 23 cm above the ground, and was fairly conspicuous. A male and female were within 2–5 m of the nest when first encountered. Both birds were easily lured into the open for close views.



Plate 2. Nest site of White-browed Shortwing, Ishuwa Khola, Makalu-Barun National Park, Nepal.



Plate 3. Top of White-browed Shortwing nest, Ishuwa Khola, Makalu-Barun National Park, Nepal.



Plate 4. Nest of White-browed Shortwing, Ishuwa Khola, Makalu-Barun National Park, Nepal.



Plate 5. Nest of White-browed Shortwing, Tham Danda, Makalu-Barun Buffer Zone, Nepal.

A third nest, located at c.2,710 m on Tham Danda in wet mixed oak-maple forest, was built c.12 cm off the ground in the mossy base of a spindly shrub at the edge of *ningalo* bamboo (Plate 5). The cup-like structure was made entirely of green moss and lined with black and brown moss rhizomes. There was no lateral entrance. Hanging strands of moss partially concealed the nest. Three nestlings inside were nearly fledged when inspected on 20 June 2002. A blue male, female and brown male were observed in the immediate vicinity, each carrying food. The female was particularly vocal and conspicuous.

DISCUSSION

Behaviour

Nesting males presented displays that apparently served to distract potential predators away from the nest. These various displays, in particular the more complex and eye-catching, may derive from still unknown courtship behaviour that similarly functions to attract attention. Females also emerged evidently to distract the observer from the nest, but gave only vocalisations and wing-flicking.

Plumage

Baker (1924) was first to report that males often breed in immature plumage. Stevens (1925) reported that 'males in many cases breed at the extreme upper limit of [the species's] distribution in the feminine phase of coloration' in eastern Nepal at 2,895–3,095 m. Baker (1933) refined his earlier frequency of female-like breeding plumage to 'as often in the immature as in the mature plumage', and

surmised that some males in the eastern Himalayas may never acquire blue plumage.

Soon thereafter, Ludlow and Kinnear (1937) recorded the juvenile plumage, which resembles that of females, but features distinctive pale spotting on the head and breast. This difference may have led them to discount the possibility of an intermediate phase of male plumage and opine that males are dimorphic. Oates (1883) considered that young males resembling females in Burma were in transition to adult male plumage, stating that the lores soon change to black and the white supercilium appears before any blue feathers. Colour of the lores is one of the few (and subtle) plumage differences between females and brown males: females show rufous lores, forehead and orbital skin, and a short, slightly pale supercilium lacking white (Robson 2000).

Deignan (1945) likewise posited brown males as a transition phase in northern Thailand. Ali and Ripley (1973, 1997) concluded that many males may breed in female-like plumage (citing 18 of 42 specimens measured by Kinnear), and reiterated Baker's comment on the possible permanence of brown plumage. In Burma, Oates (1883) and Smythies (1953, 1986) considered the male dimorphic with two phases 'of equal frequency'. Robson (2000, 2002), without elaboration, regarded the brown-plumaged male as a first-winter phase.

Ludlow and Kinnear (1937) summarised wing measurements suggesting that blue males are larger than brown males and females (Table 2). Unfortunately, the raw data were not published. Other authors did not distinguish between blue and brown males, or presented small data sets or summarised data (Table 2). In January

2002, I therefore measured skins of *cruralis* in BMNH, Tring, U.K. which were collected mainly by Hodgson in Nepal, Sikkim and India. Wing length of blue males was found to be significantly greater than either females ($t=5.56$, $P<0.001$) or brown males ($t=4.78$, $P<0.001$), but there was no significant difference between brown males and females (Table 2).

Brown-plumaged males are probably subadult birds that breed in transitional plumage. The less elaborate display and weak vocalisations of a brown-plumaged male I observed are consistent with this theory (Oates 1883, Deignan 1945). Female-plumaged breeding males are known 'in many other short-wing chats' (Baker 1933), e.g. Lesser Shortwing *B. leucophrys* (Ali and Ripley 1997), White-bellied Redstart *Hodgsonius phoenicuroides* (Ali and Ripley 1987), and Black Redstart *Phoenicurus ochruros* (Fleming *et al.* 1984). Subadult males may benefit from breeding in female-like plumage by avoiding the costs of male-male competition that would be incurred if they attempted to breed in full male-type plumage.

Nesting

Initial observations of breeding biology were recorded in the 1840s by Hodgson from collectors working in the Darjeeling area (northern Bengal, India) and in central Nepal. According to Hodgson, the species builds a 'somewhat globular' nest with a lateral entrance, attached to creepers near the ground at the base of a tree trunk. Nests are built of green moss and moss roots, with bamboo leaves and pieces of fern affixed to the exterior. Hair-like fibres line an inner cup containing 3–4 eggs. The breeding season was stated as April and May (Hume 1873).

Hume's draft report of 1873 was subsequently edited and published by Oates (1889), who retained Hodgson's nesting data for White-browed Shortwing, but erroneously included data from three nests of very different structure: a 5×10 cm shallow cup composed mainly of fine black roots placed 60–90 cm above the ground in brushwood. The nests were found in Sikkim at 1,500–2,400 m in June and contained 2–4 undescribed eggs. Osmaston (1904) was skeptical of Oates's additional nests and reported finding seven nests in June and July 1903 near Darjeeling at 1,800–2,400 m. All his nests were like Hodgson's: concealed, moss-covered domed structures on a rock face or tree trunk, lined with fine roots, and accessed via a lateral entrance. Maximum clutch size was given as three.

Baker (1933) described very similar nests of the species from wet oak-rhododendron forests at 1,500–1,890 m in

the Khasia Hills (north-east India). However, he ascribed the first nest ever found of White-browed Shortwing to F. Gleadow, who purportedly gave a cup-like nest lined with fern stalks to Osmaston. The citation refers to Osmaston (1898), part II of an article on birds nesting in India that contains no shortwing records, and there are none in part I either (Osmaston 1897). Gleadow's nest reportedly contained two White-browed Shortwing eggs and a third egg which was attributed to Lesser Cuckoo *Cuculus poliocephalus* (Baker 1933). This instance of brood parasitism was subsequently repeated by Ali and Ripley (1973, 1997) and Robson (2000), although Osmaston (1898) wrote that the host species had not been observed, and appealed for suggestions regarding its identity.

Except for the lack of a lateral entrance in two of the nests I observed, they conform to Hodgson's description (as cited by Hume 1873), and do not differ substantially from those reported by Osmaston (1904) and Baker (1933). Differences in nesting material may be explained by local availability. Undergrowth at the Ishuwa sites was dominated by bamboo and was relatively deficient in moss.

Through much of its range, White-browed Shortwing often occurs near forested streams (Delacour 1947, Meyer de Schauensee 1984) or favours such habitat (Smythies 1953, Ali and Ripley 1973, Inskipp and Inskipp 1991, Grimmett *et al.* 1998, MacKinnon and Phillipps 2000). Martens and Geduldig (1990) categorise the species as a 'torrent bird', based on observed affinity to running water and the high pitch of whistled parts of its song. However, the nearest water (a small trickle) at the first nest in the Ishuwa was c.100 m away, and flowing water was even farther (c.180 m) from the second nest. The nearest water at the Tham Danda site was not determined, but there was none within 100 m.

Status

White-browed Shortwing has probably been overlooked in Nepal owing to its silent and shy behaviour outside the breeding season. Based on encounters from the 2000, 2002 and other treks (Cox 1999; unpublished data) in suitable habitat in central and eastern Nepal, in particular moist, lower temperate broadleaf forest with a bamboo-dominant understorey, the species is locally fairly common.

Since description of the species by Blyth in 1843 (Roonwal and Nath 1947) thirteen subspecies of White-browed Shortwing have been partitioned, including seven from the Philippines (Kennedy *et al.* 2000). As the BMNH and NMNH collections show, male plumage varies

Table 2. Wing length (mm) of White-browed Shortwing.

Source	Blue males	Brown males	Females	Location/notes
Stevens (1925)			68, 68.5	Northern Assam
Stevens (1925)	71.5	68, 68, 68.5	64.5	Sikkim and Darjeeling area
Ludlow and Kinnear (1937)	66–73 (n=24)	64–67 (n=18)	63–70 (n=13)	Summary of Kinnear's data from Indian subcontinent
Roonwal and Nath (1947)	64, 68, 70, 71, 71		65–68 (n=3)	Darjeeling area and Manipur
Biswas (1961)		68, 68, 69	64, 66, 66, 66	Nepal
Ali (1962)	70, 72			Sikkim
Ali and Ripley (1973)	64–72	64–72	64–68	Pooled data of Ali (1962), Biswas (1961), Roonwal and Nath (1947)
BMNH skins	mean=67.8 (n=25)	mean=65.4 (n=24)	mean=64.8 (n=19)	Mainly Hodgson's from Nepal, Sikkim and India

markedly among apparently isolated forms in the Philippines, China, South Asia and the Greater Sundas. Further studies of reproductive biology and plumage phases would be valuable, but more urgent need arguably exists for taxonomic review and ecological research to determine the conservation requirements of this enigmatic and intriguing species.

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