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Source: Ardea, 100(2) : 187-195

Published By: Netherlands Ornithologists' Union

URL: https://doi.org/10.5253/078.100.0210

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Recent, rapid, colonisation of Lao PDR from the south by Yellow-vented Bulbul *Pycnonotus goiavier*

J.W. Duckworth[1]



Duckworth J.W. 2012. Recent, rapid, colonisation of Lao PDR from the south by Yellow-vented Bulbul *Pycnonotus goiavier*. Ardea 100: 187–195.

Across most of the tropics it is often difficult to tell whether extensions of known range by bird species reflect genuine change or are artefacts of increased observation. Yellow-vented Bulbul *Pycnonotus goiavier* is a mainly Sundaic passerine known from southern Indochina (southern Thailand, Cambodia and southernmost Vietnam) for many decades. The first Lao record came only in 1996 but since then the species has spread north through Lao PDR along the Mekong and some major tributaries. All Lao records are from the lowland plains, in non-forest habitat. Inspection of the locations of records and of bird-recording patterns in Lao PDR over time indicate that this bulbul's northern expansion, paralleled by one in adjacent Thailand, is surely not simply the belated finding of a species long-overlooked. Both climate change and habitat change (forest conversion and fragmentation) are plausible causes. That five of six non-forest passerines that have colonised (or massively expanded in) Lao PDR in the last 30 years are from the south, with one from the west but none from the north, may suggest climatic change as the cause, but their rates of expansion far outstrip northward temperature movement. While Yellow-vented Bulbul's change in national status is obvious, even though Lao PDR is one of the least known countries for birds in South-east Asia, disentangling the roles of these two simultaneous major effects in avifaunal change in South-east Asia is challenging.

Key words: climate change, deforestation, habitat change, knowledge deficit, Laos, *Pycnonotus goiavier*, range expansion

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Many dramatic range extensions in Holarctic birds in recent decades have been well documented (e.g. Fisher 1953, Bonham & Robertson 1975, Hengeveld & van den Bosch 1991, Wehtje 2003, Choi *et al.* 2011), benefiting from the region's rich historical data, the relatively high levels of bird status monitoring in many of its countries and an upsurge in interest reflecting changing climate (Rosenzweig *et al.* 2007, Møller *et al.* 2010). Across most of the tropics, however, bird recording levels are so low that whilst even quite major extensions of known range are commonplace, it is usually difficult to determine which are genuine expansions and which are simply the belated finding of species previously overlooked. Across the tropics, recent decades are seeing unprecedented human-caused direct changes to habitats, particularly in South-east Asia, simultaneously with global climate change (e.g. Sanderson *et al.* 2002, Sodhi *et al.* 2004, 2011, Harris *et al.* 2011, Wormworth & Sekercioglu 2011), so major range shifts of tropical birds can be expected to become more common. The effects of climate change on tropical forest-dependent species status seem likely to be profoundly negative (Sekercioglu *et al.* 2008, Harris *et al.* 2011), but there has been little speculation on what will happen to non-forest species, many of which, particularly in South-east Asia, have greatly increased habitat available to them.

The present note documents the ongoing dramatic northward colonisation of a non-forest tropical South-east Asian passerine, the Yellow-vented Bulbul *Pycnonotus goiavier*, into one of the region's least well recorded countries. It exemplifies the difficulties of inferring causation in such changes: northward spread is consistent with climate change, but such major expansion of a non-forest species may simply result from habitat change. The Yellow-vented Bulbul occurs in mainland South-east Asia, the Greater and some Lesser Sundas and the Philippines, and has been intro-

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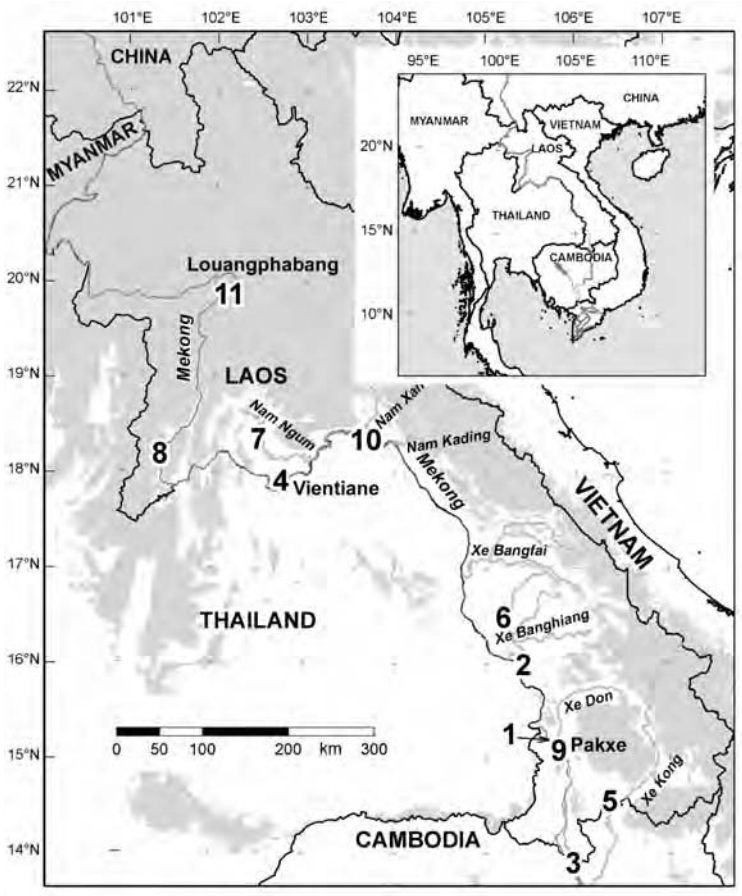


Figure 1. Lao PDR, showing records of Yellow-vented Bulbul *Pycnonotus goiavier*, and locations mentioned in the text. Shaded land is at or above 200 m altitude. Records are numbered chronologically, oldest first.

duced to Sulawesi (Fishpool & Tobias 2005). Its distribution is mainly Sundaic. As of 1970, the northernmost records in the Mekong basin or Vietnam were from Komphong Thom and Siem Reap provinces, Cambodia (Thomas & Poole 2003) at roughly 13°30'N; records came from a little further north in non-Mekong Thailand and even further so in the Philippine archipelago. The first record for Lao PDR was in May 1996 (Evans *et al.* 2000), and there were two further records in 1997 (Cunningham 1998, Evans 2001), the northernmost being 250 km north of Siem Reap town. These authors did not speculate whether the species was an overlooked, scarce, resident of long standing in Lao PDR, or a new arrival.

METHODS

Survey area

Lao People's Democratic Republic (Lao PDR; Laos) covers a landlocked 236,800 km^2 of mostly rugged terrain in northern (=non-Sundaic) South-east Asia. Compared with most of this region, a more of the country remains forested and human population density is low (Thewlis *et al.* 1998). Well into the 1990s, large towns were few, not particularly large, and were mostly separated from each other, even along major rivers and roads, by large tracts of forest (albeit mostly much degraded) and scrub as well as agriculture. Urbanisation is now proceeding rapidly, particularly on the plains and along major roads. Other than streams, natural wetlands are almost restricted to the plains beside the River Mekong and its major tributaries. These plains are heavily farmed, with productivity intensifying, and human population density matches the regional average (Lefroy *et al.* 2010).

Survey methods

A comprehensive search was made for published and unpublished information about Yellow-vented Bulbul in Lao PDR until the end of 2010. After only limited bird collecting in Lao PDR during the first half of the 20th century, very little new bird information was generated during the 1950s–1980s in the country, excepting the records of W.W. Thomas; but during the 1990s many bird surveys were undertaken, mostly in association

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with development of an extensive national protected area system (e.g. Berkmüller *et al.* 1995, Thewlis *et al.* 1998, Duckworth *et al.* 1999, 2002, Duckworth & Tizard 2003). Recognition that the conservation status of non-forest birds in Lao PDR was poorly known relative to forest species (Duckworth *et al.* 2002, Fuchs *et al.* 2007) meant that from 1999, and particularly 2004, onwards the author's recreational bird-watching has targeted such habitats. These include even towns: their rapidly changing avifauna reflects the strong recent declines in subsistence hunting of urban birds (which had been extraordinarily intense in the 1980s and early 1990s) spurred by rapidly increasing affluence (Duckworth & Tizard 2003, Fuchs *et al.* 2007). In particular, the author observed extensively in towns, villages, farmland and wetlands during November 1998 – April 2000, August 2003, December 2003 – July 2005 and November 2007 – November 2010. Locations, which spanned nearly all provinces of the country and ranged in altitude from the plains at 100 m to over 1800 m, varied across the years, but included various Mekong-side towns, villages and semi-natural wetlands. Lao locations mentioned in the text are portrayed in Figure 1.

RECORDS

All Lao records traced are given in Table 1 and portrayed in Figure 1. All 1990s records were from the south, with the first record in the north not until 2004 (Ban Nongpen); this was a further northward extension of *c*. 220 km. All early records were in or within a few kilometers of the Mekong channel; in 2005 birds started to be found on the plains of major Mekong tributaries. All records come from within 1 km of either riverbanks or wetland complexes, and most are in areas with highly anthropogenic habitat, often towns. All records are from plains level, the highest in altitude therefore being furthest upstream along the Mekong, at Louangphabang (300 m). The first evidence of general occupation of an area was not until 2010 and involved, surprisingly, the northernmost two areas so far, Paklay and Louangphabang, where birds were recorded from, respectively, three and two adjacent towns/villages along the Mekong. In 2010 there were also multiple sightings from the country's southernmost large Mekong-side town, Pakxe, including the first proof of Lao breeding: a recently fledged juvenile. The 16 records (or clusters of records) all come from February–August, from formal bird survey (four) and, mostly, recreational bird-watching (12).

DISCUSSION

That Lao records come mainly from sub- and peri-urban orchards, scrub and wetlands is consistent with the species's association with non-forest habitats, including towns, elsewhere (Fishpool & Tobias 2005). The monthly distribution of records (14 in March–July with singles in February and August) could suggest the species is a wet-season breeding visitor to Lao PDR, but in the light of its evidently resident status in its main range (Fishpool & Tobias 2005), this seems unlikely. Pending more records for definitive assessment, this pattern is assumed to reflect the reduced observation during the late wet season (August–October) and early dry season (November–January).

That the apparent colonisation might simply reflect a chance pattern from overall low observation effort needs serious consideration, particularly because this bulbul is "of decidedly patchy distribution in Bangkok's suburbs" (Round 2008: 137). If this is so elsewhere in its northern range (it is not applicable to its core Sundaic range, either in Indonesia (J.B.C. Harris *in litt*. 2012) or Malaysia (JWD, unpubl. data)), it could readily be overlooked in any given region by merely superficial coverage. The pulses of records in 1996–1997 (three), 2004–2009 (five) and, particularly, 2010 (seven) relative to the lack of records in 1998–2003 probably reflects patterns of bird observation rather than of bulbul numbers: little survey or bird-watching was undertaken in the country in 2001–2003, and much of that in 1998–2000 was in the northern half of the country, where the species was not then known. And, in general, 1990s surveys focussed on forest habitats inimical to this species (and were undertaken by observers intent on seeking and documenting threatened and/or restricted-range species, rather than those with no global conservation needs); observation in this species's habitats was much higher from 2004 onwards.

Overall, it is unlikely that the species was present, but overlooked, in Lao PDR much before 1996. Don Pong, Keng Khan-Gneng, Ban Phonsaat, Nong Souy and the Paklay area have been too poorly surveyed to determine this bulbul's abundance there. At four sites with high relevant survey effort this bulbul was seen only once: Don Son lies adjacent to Don Khon, which was surveyed in every month in 1997 without finding the bulbul (Cunningham 1998); Ban Nongpen was surveyed during 2003–2005 at least once in each of the 12 calendar months (Duckworth & Evans 2007); Nong Thaleo lies on the lower Nam Ngum plain where many wetlands were visited several times each during 2009, with Nong Thaleo itself receiving six visits (Duckworth

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Table 1. Lao[1] records of Yellow-vented Bulbul *Pycnonotus goiavier*. Records are listed in chronological order. Lao-language place name elements: Ban = village of; don = island; keng = rapids; nam = river; nong = pool; xe = river.

N° on Fig. 1	Site	Date	Count[2]	Habitat	Other notes	Source
1	Don Pong; 15°11'N 105°43'E[3]	6 May 1996	2-s	Scrub–grass–pool mix	Mekong island	Evans *et al.* 2000
2	Keng Khan-Gneng; 16°01'N, 105°25'E	30 Mar 1997	1-r	Shrubs amid bedrock	Mekong edge/channel outcrops and sand	Evans 2001
3	Don Son; 13°56'N, 105°57'E	Aug 1997	2-r	Scrub and agriculture	Mekong island	Cunningham 1998
4	Ban Nongpen, Vientiane; 17°57'N, 102°45'E	16 Apr 2004	3-s	Scrub amid dry paddy stubbles, a few hundred yards from the large Nong Pen	2.5 km from the Mekong	JWD
5	Ban Phonsaat; 14°35'N 106°21'E	3 Jun 2005	several-r	Orchards and scrub of the village itself, hard by the Xe Pian	50 km from the Mekong	M.R. Bezuijen 2006, *in litt.* 2010
6	Nong Souy; 16°31'N, 105°12'E	21 Apr 2007	2-r	Agricultural reservoir; large verdant swamps	35 km from the Mekong	JWD
3	Don Khon; 13°56'N, 105°56'E	20–22 Feb 2008	2+-r	Heavily encroached scrub and agriculture	Mekong island	P. Mollat *in litt.* 2008
7	Nong Thaleo; 18°23'N, 102°30'E	19 Jul 2009	2-s	Dense floating bushland swamp, in large wetland complex	50 km from Mekong	Duckworth in press
8	Ban Houaylay-noy; 18°14'N, 101°25'E	24 Mar 2010	1-r	Silk-cotton *Bombax* tree amid gardens	Mekong banktop	JWD
8	Paklay; 18°13'N, 101°25'E	24 Mar 2010	2-r	Garden coconuts and ornamental trees	100 m from Mekong	JWD
8	Ban Namxong; 18°16'N, 101°26'E	31 Mar 2010	2; 2-r	(i) Mango and coconut trees; (ii) nectaring at ornamental vine, then (same birds?) in *Homonoia*-dominated channel bushland	Mekong banktop; (ii) also in seasonally dry Mekong channel	JWD
9	Pakxe; 15°07'N, 105°48'E	16 Apr 2010	6; 2; 1-r	(i, ii) Wetland–pasture–scrub east of airport, at edge of orchards (iii) orchard	(i) 400 m from Mekong (ii) Mekong bank-top	JWD
10	Pakxan wetlands; 18°23'N, 103°41'E	14 Jun 2010	1-s	Wetland with much scrub	1 km from Mekong	JWD
11	Ban Natha; 19°54'N, 102°08'E	10 Jul 2010	c.4-r	Garden fruit and ornamental trees of small village	100 m from Mekong	M. Peero verbally 2010
11	Louangphabang; 19°54'N, 102°09'E	11 Jul 2010	2; 2-r	Urban large gardens with many mature fruit and ornamental trees	300 m and 100 m from Mekong	JWD
7	Nong Fangdeng; 18°24'N, 102°29'E	31 Mar 2012	1+-r	Swamp bushland	50 km from Mekong	JWD

[1] Duckworth *et al.* (2002) listed the species from the mid Lao/Thai Mekong in 2000: this referred to one on the Thai side, at Hat Soung (opposite the mouth of the Xe Bang-Nouan; 15°59'N 105°26'E) on 26 April 2000, probably in bank-top, rather than channel, habitat (P.D. Round *in litt.* 2010).
[2] Multiple numbers indicate the different group-sizes observed. Records came during formal survey (s) or recreational bird-watching (r).
[3] Erroneously given as 1966, and in central Lao PDR, by Fishpool & Tobias (2005).

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in press); and the Pakxan wetlands have been visited intermittently since 1994, with particularly intense bird-watching during 2000–2002 (C. Wood *in litt.* 2004), two pulses in 2005 (C. Wood and JWD), and three in 2010 (JWD *et al.*, unpubl. data). A genuine scarcity, perhaps only intermittent presence at these sites, is apparent around time of sighting, consistent with natural rarity at the edge of the species's range or, equally, the early stages of colonisation. Supported by the 2008 record from Don Khon on a short visit a decade after year-round bird-watching failed to find the species, the 2010 observations in Pakxe almost prove recent colonisation: the town was well covered historically by Engelbach (1932), and was a site of much casual bird-watching from 1992 to 2003, including numerous observations by M.K. Poulsen (*in litt.* 2008) during 2000–2001 and, of particular relevance to this bulbul, several mornings by the author in August 2003 counting urban and suburban birds. Similarly, the author sought urban birds in Louangphabang, including the exact sites of 2010 observations, in January and April 2000 and in November 2004, without finding the species.

The historical collection record from Lao PDR is so patchy and, overall, limited (Thewlis *et al.* 1998) that most of the several dozen bird species first found in the country only in the 1990s–2000s, are likely simply to have been overlooked historically. That Yellow-vented Bulbul is a genuine recent colonist is, however, supported by patterns in Lao PDR's western neighbour, Thailand, which has a fuller documentation of bird distribution and status over the last century. Deignan (1963) recorded the species in Thailand no further north than the coastal provinces (up to 13°30'N, perhaps a little further north), and Lekagul & Round (1991) only to Bangkok (13°45'N), with a disjunct population in Bung Boraphet (15°42'N, 100°14'E). Now, it has been found in all recording regions of the country, "just spreading to NW, NE" (Robson 2008: 479). This colonisation northwards through Thailand has resulted in recent records from as far north as Chiang Rai, almost 20°N (P.D. Round *in litt.* 2010). Colonisation timing is thus consistent with northward spread through Lao PDR, as further indicated by observations at Mukdahan (on the Mekong; 16°33'N 104°44'E): in 2007 W. Sanguansombat found it commonly, where none had been seen in April 2000 (P.D. Round *in litt.* 2010). That in Bangkok's suburbs, "it is generally scarcer than formerly" (Round 2008) presumably reflects recent major decline in urban mature trees and wetlands there, rather than any regionally applicable trend.

Surprisingly, no expansion has been detected in Lao PDR's eastern neighbour, Vietnam. Here, Robson's (2008) compilation recorded it only from Cochinchina (the southernmost part of the country), where it was known historically (Delacour & Jabouille 1931). Whether this represents a genuine difference between Lao/Thailand and Vietnam, or simply the generally low levels of bird recording in Vietnam (Pilgrim *et al.* 2009), is unclear.

Directly south of Lao PDR, the species was already common in Cambodia in 1924, when it was found as far north as Komphong Thom at 12°42'N (Delacour & Jabouille 1925). It seems unlikely that it has been expanding steadily northward since then: rather, a rapid northward movement seems to have started in the 1990s; had it been any earlier, establishment such as around Paklay in 2010 would surely have been found in the southern Lao Mekong in the 1990s, when there were, instead, just odd records. Supporting a long-term presence in southern Indochina, the populations along the Thai coast from Samut Songkran province on the peninsula to Trat province on the Cambodian border (and, by extension, into Cambodia and Vietnam) were distinguished by Deignan (1955, 1963) as *P. g. jambu*, whereas Sundaic Thailand is occupied by *P. g. personatus* (considered a synonym of wide-ranging Sundaic *P. g. analis* by Mees (1986) and subsequent authors). This recognisable morphological divergence suggests that expansion out of the Sundaic region is not recent. The Lao records are presumably of *P. g. jambu*, but no specimens exist to confirm this.

For a species presently tied to the plains and associated with damp areas (Figure 2), colonisation of a generally rugged region such as Lao PDR is, unsurprisingly, occurring along river valleys. Whatever the proximate trigger of this bulbul's sudden northward expansion that the Mekong happens to run roughly north–south doubtless aids it. The expansion's cause remains unclear. Two obvious candidates, for a non-forest bird from the south, are deforestation (in Lao PDR and neighbours) and climatic warming; but other factors cannot be excluded.

Over the last few decades, forest cover in Lao PDR has declined in total area, and become much more fragmented and degraded (Table 2). Whatever the precise definition of 'forest' used (and that of Department of Forestry (2005) does not discriminate forest as habitat for forest-dependent birds particularly well; Thewlis *et al.* 1998), these changes are conducive to expansion by non-forest birds. However, non-forest habitat already covered half the country by 1990, such a large area as to suggest simple forest loss is not the explanation.

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Moreover, large non-forest areas have existed for well over a century around the various Mekong-plain towns and large villages (Garnier 1885), even though their number and size has expanded visibly over the last two decades. Indeed, the area of what appears to be this bulbul's favoured habitat in Lao PDR, mature fruit orchards near wetlands, has probably decreased in the same period, with the recent rapid conversion of many such areas to housing, commerce and light industry (author's observations in most major Mekong plain towns). Thus, perhaps connectivity of degraded land (which plausibly aids Yellow-vented Bulbul dispersal) is more relevant than overall deforestation. The country's main road, route 13 (connecting most of the main Mekong-side towns), runs effectively north–south. In 1992, when the author first travelled it, long stretches still ran through forest, albeit heavily degraded. Now, no substantial lengths of road between at least Louangphabang and Pakxe are flanked both sides by native forest. The average of forest loss in the country masks distinct regional differences that at first sight argue against habitat-triggered colonisation from the south: in south Lao PDR, the access route for the bulbul, forest cover declined by only 1.8% between 1992 and 2002, compared with an 8.4% loss during that period in the north (Department of Forestry 2005); but, this is probably not relevant assuming that deforestation corridors are more important in aiding dispersal than are reductions in overall forest cover. In support of this, in interior Borneo, this bulbul seems less prone to appear in fresh islands of clearance (from mining or logging) amid forest than do two other species of such habitats, Yellow-bellied Prinia *Prinia flaviventris* and Eurasian Tree Sparrow *Passer montanus* (I.A. Woxvold *in litt.* 2012). A challenge to the degradation corridor suggestion is that route 13 south of Louangphabang runs for over 200 km through rugged highlands; perhaps here, the Mekong allowed dispersal from Paklay, itself colonised direct from Thailand a little to its south, and explaining the surprising lack of settlement in Vientiane by at least 2010. The Mekong from Louangphabang south to the Thai border had, at least by 2012, no forest tracts blocking dispersal by non-forest birds (author's boat-based survey).

Table 2. Changes in forest cover in Lao PDR, 1992–2002[1].

Attribute	Status in 1992	Status in 2002
Forest with >20% canopy cover[2]	47.2%[3]	41.5%[3]
Forest stands <10 ha	0.9%[4]	6.7%[4]
Forest stands >10 km[2]	88%[4]	54%[4]
'Dense' forest (not precisely defined)	29%[4]	8.2%[4]

[1] After Department of Forestry (2005).
[2] Including plantations: not a measure of native forest status.
[3] As a percentage of the total land area of Lao PDR.
[4] As a percentage of the total forest area of Lao PDR.

With regard to climate change, the species is tied in Lao PDR to the lowlands, which have the warmest climate; but this is probably an effect of well-watered plains (the species's main biome) being largely lowland. Indeed, the average annual mean and low winter temperatures in the northern Lao areas occupied by this bulbul (Louangphabang and Paklay) are much colder than the southern Lao hills above occupied altitudes (Lefroy *et al.* 2010, notably their Figs 2.4, 2.6). Calculated temperature change rates for Lao PDR (Lefroy *et al.* 2010: 7–8), which reflect generally slower change in temperature with latitude in the tropics than at higher latitudes (IPCC 2007, Colwell *et al.* 2008), the northern occupied areas are today still considerably colder than were the southern areas 30 years ago, before they were colonised by Yellow-vented Bulbuls. However, without detailed knowledge of bulbul dispersal patterns and microgeographic variation in climate, the coarsely averaged pictures of climate change analyses may simply not show the temperature patterns relevant to this bird.

Notwithstanding the difficulties of distinguishing genuine expansions of range in Lao PDR from results of fuller survey, several other non-forest bird species have clearly colonised the country since 1992. Since each species's first record, most have shown, and continue to show, rapid range expansion: Peaceful Dove *Geopelia striata*, Pied Fantail *Rhipidura javanica*, House Sparrow *Passer domesticus* and White-browed Crake *Porzana cinerea*; additionally, Brown-throated Sunbird *Anthreptes malacensis* has shown massive population increase and range expansion in the same period (e.g. Duckworth & Evans 2007, Duckworth in press; records of these species will be detailed elsewhere). Including the bulbul, and recognising that the dove derives from non-native populations in Thailand (Round 2008), five of these six species otherwise occur to the south of Lao PDR, although the sparrow is from the west (e.g. Robson 2008). In their main range, cold seasons are far less marked than in northern, and even southern, Lao PDR. All these species have also colonised or greatly expanded their known range in the adjacent countries of Thailand, Cambodia and/or Vietnam (e.g. Duckworth & Evans 2007, Robson 2008, Mahood *et al.* 2011, F. Goes pers. comm. 2012; and comparisons of Round 2008 with Deignan 1963), consistent with

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Figure 2. Nong Souy, Savannakhet province, Lao PDR, 3 March 2007, showing the bush-studded wetland typical of non-urban sites with Yellow-vented Bulbul records in Lao PDR. The foreground bush is the invasive American *Mimosa pigra*, which is also spreading rapidly in Lao (Photo D. Van Gansberghe).

attributing their changes in status in Lao PDR to genuine expansion.

It is more difficult to make a case that any forest bird species first recorded in Lao PDR since 1990 is a genuine colonist; this does not necessarily mean that no such colonisations are likely to have occurred, but the information to work with is even more fragmentary. The resident ornithologists of the first half of the twentieth century lived in towns, that is, non-forest habitat, so although much of their specific collecting time was spent in forest, their overall familiarity with non-forest birds' status was better. Of the many forest birds first found in Lao PDR after 1990, there are only four species lacking historical records from parts of adjacent countries that suggest strongly that they were overlooked in Lao PDR historically. Of these, only one, the montane Red-tailed Minla *Minla ignotincta*, is common and conspicuous. Even for this species, colonisation of Lao PDR is less likely than is expansion from areas of Lao PDR not historically covered (to be discussed elsewhere). If a recent colonist, it would have come from the north.

Thus, excepting possibly the minla, there does not seem to be any recent bird colonist of Lao PDR from the north. This is consistent with climatic change being the driver of these species' range extensions. The very little information on the extent to which recent climate change may be causing range shifts (geographic or altitudinal) in South-east Asian birds reflects in part the limitations of incomplete knowledge of past conditions (Clark 2007). However, altitudinal changes in bird distributions consistent with climate change have been found in South-east Asia (Peh 2007, Round & Gale 2008) and more may be in process, unremarked.

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Because Yellow-vented Bulbul is a conspicuous and distinctive species, and occupies human-modified environments, even with the current low levels of bird recording in Lao PDR it should be possible to track the further expansion of range that is likely to occur. Indeed, at its current rate of spread it might well soon to turn up in well-watched Hong Kong, assuming that the lack of records in Vietnam north of Cochinchina simply reflects limited recording there. At the larger scale, the factors behind changing bird distributions in tropical areas will remain opaque as long as so little formal monitoring occurs. While expansions such as this bulbul are of no conservation concern for the species itself, they are doubtless paralleled by the less detectable range contractions, which, if extinctions are to be minimised, need to be detected and understood in time to mitigate them. Moreover, range expansions by common species may bring them into contact with species of direct conservation concern, which latter may consequentially decline (Harris *et al.* 2011). The need for understanding species range changes is arguably more acute in South-east Asia than in any other similarly sized area of the world, given the concentration of other threats driving declines of such high magnitude in so many habitats and species there (Sodhi *et al.* 2004).

ACKNOWLEDGEMENTS

Many thanks to Mark Bezuijen, Tom Evans, Roland Eve, Paul Mollat, Michel Peero, Michael Poulsen, Philip Round, Rob Timmins, Rob Tizard, Dirk Van Gansberghe, Chris Wood and Iain Woxvold for information on their sightings of this bulbul, or lack of them, in Lao PDR and adjacent areas, to Simon Mahood, John Pilgrim, Rob Timmins and Jack Tordoff for deep discussion over the possibility that any forest species might be a recent colonist of Indochina, Rob Timmins for preparing the map, Dirk Van Gansberghe for the habitat photograph, and Berton Harris, Rob Timmins, Kees van Oers and an anonymous reviewer for their helpful comments on an earlier draft.

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SAMENVATTING

Verscheidene vogelsoorten in de tropen lijken hun verspreidingsgebied uit te breiden. Een reden hiervan kan zijn dat de waarnemingsdichtheid is toegenomen doordat veel tropische landen bij vogelaars steeds meer in trek raken. De kans dat vogels in gebieden waar ze schaars zijn, worden waargenomen kan daardoor toenemen. Een andere, moeilijk te onderscheiden reden kan zijn dat het daadwerkelijk om een expansie van het leefgebied van een soort gaat. In dit artikel laat de auteur aan de hand van waarnemingen aan de Wenkbrauwbuulbuul *Pycnonotus goiavier* in Laos zien dat de noordelijke expansie van deze soort wordt veroorzaakt door een daadwerkelijke uitbreiding van het leefgebied. De Wenkbrauwbuulbuul is een zangvogel die, in tegenstelling tot de voornaamste inheemse avifauna, voornamelijk voorkomt in bosarme gebieden, vaak met menselijke invloeden. In overeenstemming met een aantal andere soorten die verschuivingen vertonen in hun verspreiding in Laos, is het de noordelijke verspreidingsgrens die opschuift. Dit is een indicatie dat de verschuivingen voornamelijk veroorzaakt worden door een verandering in het klimaat. In het geval van de Wenkbrauwbuulbuul is als alternatieve verklaring een verandering van het habitat echter niet uit te sluiten. Door ontbossing en verstedelijking is het natuurlijke leefgebied voor deze soort sterk uitgebreid. De auteur stelt dat het een grote uitdaging is om in Zuidoost-Azië deze twee factoren van elkaar te scheiden, aangezien beide factoren de twee voornaamste redenen zijn voor een grote verandering in de avifauna in dit gebied. (KvO)

Corresponding editor: Kees van Oers
Received 12 December 2011; accepted 8 July 2012

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