

On Sálim Ali's trail: A comparative assessment of southern Kerala's avifauna after 75 years

C. Sashikumar, C. K. Vishnudas, S. Raju & P. A. Vinayan

Sashikumar, C., Vishnudas, C. K., Raju, S., & Vinayan, P. A., 2014. On Sálim Ali's trail: A comparative assessment of southern Kerala's avifauna after 75 years. *Indian BIRDS* 9 (2): 29–40.

C. Sashikumar, Sree Nilayam, Pattanur PO, Kannur 670595, Kerala, India. Email: csashikumar@gmail.com

C. K. Vishnudas, Vishnu Nivas, Karimkutti PO, Kalpetta 673121, Wayanad, Kerala, India. Email: ckvishnudas@yahoo.co.uk

S. Raju, Kaval Variam, Kodakara, Thrissur, Kerala, India. Email: rajukavil@gmail.com

P. A. Vinayan, Pandancheri House, Vemom PO, Mananthavady, Wayanad 670645, Kerala, India. Email: pa.vinayan@gmail.com

Manuscript received on 18 July 2013.

Abstract: Seventy-five years after Sálim Ali conducted the ornithological survey in Travancore and Cochin, the localities he visited in 1933 were re-surveyed in 2009. Data on birds, and habitat, were recorded using standard methodology. 338 species of birds were encountered; densities of 49 species and abundance rates of 186 species were estimated. Changes in the status of some species were observed, as were changes in the habitat.

Introduction

Sálim Ali conducted an ornithological survey in the erstwhile Princely States of Travancore, and Cochin, of southern Kerala, in 1933, covering 19 different localities (Fig. 1). This was the first, and perhaps the only, systematic bird survey ever done in Kerala, apart from the isolated efforts of British naturalists in the nineteenth and early twentieth centuries (Ferguson & Bourdillon 1903, 1904a,b, 1904; Kinloch 1921a,b, 1923a,b). Though Ali's survey consisted mainly of collecting bird specimens, he gathered as much information as he could on the ecology and behavior of the bird life he encountered. He published his findings of the survey as a paper in eight parts entitled "The ornithology of Travancore and Cochin" (Ali & Whistler 1935a,b,c, 1936a,b,c,

1937a,b). Based on this survey he also wrote a book, *Birds of Travancore and Cochin* (Ali 1953), which was subsequently revised as *Birds of Kerala* (Ali 1969).

In December 2008, 75 years after Ali's remarkable survey, the Kerala Forests and Wildlife Department decided to depute a survey team [43] to follow Sálim Ali's ornithological trail. The major objectives of the department's project were the collection of information on the composition of avifauna, and changes in habitat quality to enable a comparison with Sálim Ali's notes. A team of four ornithologists, a botanist, and an ecological historian was constituted for this purpose. The Survey began at Marayur (10°17'N, 77°10'E) on 3 January 2009, and concluded at Karupadna (10°16'N, 76°12'E) on 31 December 2009.

Ali's extensive field experience and deep knowledge of the birds of the Indian Subcontinent allowed him to make qualitative assessments of the relative abundance of many of the avian species he encountered. He even, specifically, recorded the absence of some species in certain areas. Comparing such information was possible, to a certain extent, with the quantitative data gathered during the present survey.



Fig. 1. Sálim Ali's 1933 survey locations in Kerala.



43. Survey team at Pambamala, Periyar Tiger Reserve. L to R: S. Raju, C. Sashikumar, C. K. Vishnudas, S. Kannan and P. A. Vinayan.

Photo: C. K. Vishnudas

Methodology

All the 19 sites surveyed by Ali were re-surveyed on his 1933 survey dates. The survey period included the migratory season as well as the breeding season and thus there was a fair chance of encountering both the migrant as well as the resident birds. The methodology was adapted from Gibbons & Gregory (2006). A three-hour, variable length transect route was selected by the team at a site for a day. Due to practical reasons, this transect was either a forest road, or a trekker's path, or a streambed, and not necessarily a straight line. Birds that were seen or heard were assigned to four distance bands, namely, 0–5 m, 5–10 m, 10–30 m and >30 m. Birds seen overhead, like raptors, swifts, etc., were not assigned any distance band; just their numbers were recorded. All the details were recorded on pre-designed datasheets. The transect data was analysed using the software 'DISTANCE5.0' (Thomas *et al.* 2005), following the analysis approach, and recommendations, of Buckland *et al.* (2001), to estimate the density and encounter rates of birds. Aural and visual observations were combined for analysis.

Birds of prey (nocturnal and diurnal), swifts, swallows, nightjars, and wetland birds were excluded from DISTANCE based analysis. The data on diurnal birds of prey were compiled separately and analysed for encounter rates and species richness. Nocturnal birds of prey were included in site checklists; Jungle Owlet *Glaucidium radiatum* was detectable in sufficient numbers, even in daytime, by its behavior and vocalisation, so that its density could be estimated. Wetland birds were counted directly and analysed separately.

At the very outset we realised that comparison with the 1933 survey would be possible only to a limited extent and so we focused more on collecting data that would serve as a benchmark for future studies. Another constraint was that we were bound to follow the dates and the locations of the 1933 survey and thus had little freedom to carry out a more systematic random sampling of the habitats.

Study area

The study area comprised southern Kerala, and part of Tamil Nadu (Kanyakumari district), i.e., the Western Ghats south of the Palghat Gap, consisting of 19 locations, from Wadakkancheri (10°40'N, 76°16'E) to Cape Comorin (08°04'N, 77°32'E) (Fig. 1). A majority of the locations were along the Western Ghats [44], in low, as well as high, altitude forests.



Photo: C. K. Vishnudas

44. Southern Western Ghats: a view from Munnar.

Results & discussion

During the survey, we walked 131 transects altogether, covering a total distance of 282.35 km. The transect surveys were carried out in 12 habitat categories: Tropical moist-evergreen, Tropical semi-evergreen, Tropical moist-deciduous, Tropical dry-deciduous, Shola (stunted montane evergreen forests), Shola-grassland complexes, Tea-shola-grassland, Thorny scrub jungle, Cardamom-, Teak-, Coffee-, and Rubber plantations. Transect altitudes ranged from sea level (Vembanad: 09°35'N, 76°31'E) to 2530 m (Meeshapuli Mala in Munnar: 10°05'N, 77°04'E).

We counted 77,547 individual birds belonging to 338 species from the 131 line transects in terrestrial habitats, and from direct counts in 33 locations in wetlands. A checklist of the birds recorded at each of the 19 locations is given in the Appendix. Fifteen species endemic to the Western Ghats, and 19 species categorised by IUCN as Globally Threatened (BirdLife International 2014), were recorded during the survey.

Table 1. Density estimate of birds during 2009, from 19 study sites

Species	Status	Density of birds/km ²	Standard error
Southern Hill-Myna	R	50.3 (43–57)	6.7
Red-whiskered Bulbul	R	46.8 (40–52)	6.3
White-cheeked Barbet	R	45.24 (41–49)	3.5
Greenish Leaf-Warbler	M	44.8 (41–47)	3.1
Yellow-browed Bulbul	R	35.55 (31–39)	3.5
Plain Flowerpecker	R	31.7 (28–34)	3.0
Blue-winged Parakeet	R, E	31.5 (27–35)	4.4
Jungle Babbler	R	30.9 (24–36)	5.5
Plum-headed Parakeet	R	30.1 (25–35)	4.8
Oriental White-eye	R	28.3 (22–34)	6.2
Black Bulbul	R	27.2 (22–32)	4.8
Indian Hanging-Parrot	R	26.1 (23–29)	3.4
Blyths Reed-Warbler	M	25.7 (23–28)	2.4
Scarlet Minivet	R	24.1 (21–27)	3.0
Greater Racket-tailed Drongo	R	21.7 (17–25)	3.6
Small Sunbird	R,E	20.7 (18–22)	2.4
Pompadour Green-Pigeon	R	19.8 (15–23)	4.3
Large-billed Leaf-Warbler	M	15.6 (13–17)	1.9
Red-vented Bulbul	R	15.5 (11–19)	3.6
Crimson-throated Barbet	R	14.8 (11–17)	3.2
Grey Jungle fowl	R	14.3 (12–16)	1.7
Malabar Grey Hornbill	R,E	13.9 (11–15)	2.3
Ruby-throated Bulbul	R	13.8 (10–16)	3.2
Jungle Crow	R	13.6 (11–15)	2.0
Common Iora	R	13.5 (11–15)	1.5
Asian Fairy-Bluebird	R	13.2 (11–15)	1.79
Grey-breasted Laughingthrush	R,E	12.9 (8–16)	4.0
Quaker Tit-Babbler	R	12.3 (10–14)	2.0
Mountain Imperial-Pigeon	R	12.3 (10–14)	2.4
Malabar Whistling-Thrush	R	12.08 (11–13)	1.35
Indian Scimitar-Babbler	R	11.6 (9–13)	1.5
Gold-fronted Chloropsis	R	11.5 (9–13)	1.8
Bronzed Drongo	R	9.6 (8–10)	1.2
Ashy Drongo	M	9.2 (8–10)	1.2
White-browed Bulbul	R	8.9 (5–11)	2.9
Large Wood shrike	R	8.3 (7–9)	1.2
White-bellied Treepie	R,E	8.2 (7–9)	1.2
Eurasian Golden Oriole	M	8.2 (7–9)	1.1
Emerald Dove	R	7.7 (6–8)	1.3
Indian Treepie	R	7.3 (6–8)	1.3
Purple Sunbird	R	7.1 (6–8)	1.2
Spotted Dove	R	6.8 (5–7)	1.2
Asian Paradise-Flycatcher	M	6.8 (5–7)	1.04
Black-naped Monarch-Flycatcher	R	6.3 (5–7)	1
Little Spiderhunter	R	6.1 (5–7)	1.1
Tickells Blue-Flycatcher	R	5.9 (5–6)	1
Common Tailorbird	R	5.9 (5–6)	0.11
Greater Coucal	R	5.7 (5–6)	0.83
Grey Wagtail	M	5.2 (5–6)	0.76

Abbreviations: E=Endemic; M=Migrant; R=Resident

Density estimates

Densities of 49 species, which had more than 60 detections, were estimated (Table 1); these included five Western Ghats endemics, and seven migrants. Southern Hill Myna *Gracula indica* had the highest density of 50.3 birds/km². Out of the 49 species, 69% were habitat generalists, whereas 31% were habitat specialists. We could estimate the density of six, of the eight, species of bulbuls that occur in Kerala; among which, the generalist Red-whiskered Bulbul *Pycnonotus jocosus* had the highest density of 46.8 birds/ km².

Abundance of birds

Of the 338 species of birds recorded during the survey, 186 were forest birds. We calculated the encounter rate of these forest birds by dividing the total number of birds of each species encountered by the total field hours and then converting the value to birds per 100 hrs. Based on the encounter rates, we classified birds into different ordinal scales of abundance (Bibby *et al.* 1998). According to this, 12 species were found to be abundant, 31 were uncommon, and 11 species were found to be rare. A list of the most abundant birds is given in Table 2. A perceived drawback of such a methodology is that encounter rate is related to the detectability of the species and may be biased towards vocal and spectacular species; leaving the cryptic, silent, and skulking species under-recorded. Season too is a factor affecting the detectability of birds. If the abundance scales produced during this survey are compared with those generated in future surveys, this should be bourn in mind.

Endemic Species

Density estimates of the Western Ghats endemics that we encountered revealed that Blue-winged Parakeet *Psittacula columboides* was the most abundant, followed by Small Sunbird *Nectarinia minima*, Malabar Grey Hornbill *Ocyrceros griseus*, Grey-breasted Laughingthrush *Garrulax jerdoni*, and White-bellied Treepie *Dendrocitta leucogastra* (Fig. 2). However, other Western Ghats endemics, such as Rufous Babbler *Turdoides subrufus*, Wynaad Laughingthrush *G. delesserti*, Grey-headed Bulbul *P. priocephalus*, Black-and-Orange Flycatcher *Ficedula nigrorufa* [45], Nilgiri Flycatcher *Eumuias albicaudata*, and White-bellied Shortwing *Brachypteryx major* were not encountered in sufficient numbers (i.e., a minimum of 60 detections) for estimating the density, though their abundance was assessed based on the encounter rates. Nilgiri Wood-Pigeon *Columba elphinstonii* (IUCN Redlist Category: Vulnerable) had an encounter rate of

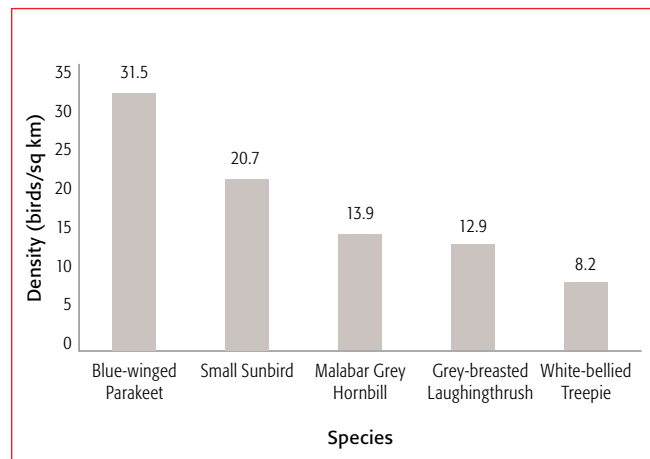


Fig. 2. Density estimates of endemic birds.



Photo: C. K. Vishnudas

45. 1-Black-and-Orange Flycatcher bathing in a stream.

6.36 birds/100 h. Ali (1937a) stated that this species was, "... not uncommon in the evergreen forest tracts of Travancore, chiefly in the hills but also lower down ... Ferguson (*J.B.N.H.S.*, xvi, 3) found it common at the summits of the hills in South Travancore and at Peermade ..." We suspect that the population of this species has declined during the past seven decades. We did not record it below 770 m.

Grey-breasted Laughingthrush has two races, south of the Palghat Gap, in the southern Western Ghats. *G. j. fairbanki* [46] occurs north of the Achankovil Gap up to the Kannan Devan Hills in Munnar, Kerala. We saw this species up to Kumarikkal, north-west of Marayur (10°17'N, 77°10'E). But it was not seen in Padagiri, Nelliampathies (10°30'N, 76°41'E), closer to the northern edge of the Palghat Gap. The southern race *G. j. meridionale* was seen at Pandimotta (08°52'N, 77°07'E) in Shendurney Wildlife Sanctuary, probably the northern-most limit in the range of *meridionale*. Further south, we observed this race in good numbers in Upper Kodayar, Kalakkad–Mundanthurai Tiger Reserve (08°30'N, 77°21'E). In their typical Shola-grassland habitat, the density estimate of this species was 114 birds/ km². Ali had described the close association of the species with *Rubus ellipticus*, a wild raspberry; we also found this to be true.

Species	Status	Count	Encounter Rate birds/100 hour
Southern Hill-Myna	R	704	203.76
Red-whiskered Bulbul	R	667	193.05
Greenish Leaf-Warbler	M	659	190.73
White-cheeked Barbet	R	641	185.52
Yellow-browed Bulbul	R	497	143.84
Blue-winged Parakeet	R,E	449	129.95
Jungle Babbler	R	440	127.35
Plum-headed Parakeet	R	413	119.53
Oriental White-eye	R	404	116.93
Black Bulbul	R	388	112.30
Indian Hanging-Parrot	R	368	106.51
Blyth's Reed-Warbler	M	363	105.06

Abbreviations: E=Endemic; M=Migrant; R=Resident



46. Grey-breasted Laughingthrush *Garrulax jerdoni fairbanki*.

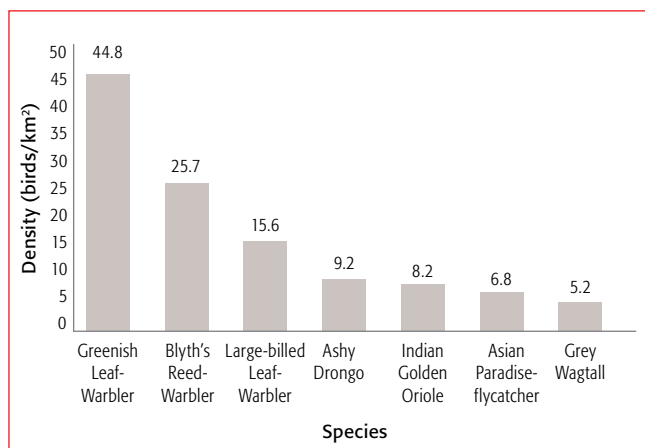


Fig. 3. Density of migrant birds.

Density of migrant birds

A comparison of the density estimates of the seven species of migrants (Fig. 3) showed that Greenish Leaf-Warbler *Phylloscopus trochiloides* was the most abundant migratory bird, followed by Blyth's Reed-Warbler *Acrocephalus dumetorum*, Large-billed Leaf-Warbler *P. magnirostris*, Ashy Drongo *Dicrurus leucophaeus*, Indian Golden Oriole *Oriolus kundoo*, and Asian Paradise Flycatcher *Terpsiphone paradise*. Interestingly, all these birds are mainly insectivorous.

Raptors

Thirty-two species of diurnal raptors were encountered during the survey. Brahminy Kite *Haliastur indus*, Crested Serpent-Eagle *Spilornis cheela*, and Oriental Honey-Buzzard *Pernis ptilorhynchus* were the most common; Mountain Hawk-Eagle *Spizaetus nipalensis* was the rarest resident raptor. Shola-grassland hosted 18 species of raptors, which was the highest among the habitats; plantations were found to be generally poor in raptor diversity. The species richness of Shola-grasslands (18 species) was followed by Moist-deciduous forest (16 species), and wetlands (14 species). High species richness of raptors is related to a good prey base: in our analysis, Moist-deciduous forests had the highest bird density of 296.2 birds/km²; this abundance of prey could be the reason for the presence of the high number of raptor species in this habitat. Compared to this, Shola-grassland had a bird density of 61.8 birds/km² only, but

the availability of additional prey, like rodents, which we did not assess, for grassland specialists, e.g., kestrel, buzzard, harrier, etc., might have accounted for the high raptor diversity of this habitat. Further, this open habitat allows the observer to have a better view of the sky to observe raptors in flight, thereby increasing the number sightings and hence the higher encounter rate. Wetlands attracted six species of migratory raptors—Western Marsh Harrier *Circus aeruginosus*, Indian Spotted Eagle *Aquila hastata*, Greater Spotted Eagle *A. clanga*, Steppe Eagle *A. nipalensis*, Osprey *Pandion haliaetus*, and Peregrine Falcon *Falco peregrinus*—constituting 40% of the raptors found in this habitat. An immature White-bellied Sea-Eagle *Haliaeetus leucogaster* was observed at Umayar in Kallada Reservoir (Shendurney Wildlife Sanctuary; 08°58'N, 76°04'E) on 27 March 2009; this spot was about 60 km away from the seacoast. There are only a few stray records from south Kerala, even along the coast (Sashikumar *et al.* 2011), though there was a previous record inland from Periyar Tiger Reserve (Robertson & Jackson 1992). The present sighting is perhaps the southern-most record of this species in Kerala. Lesser Fish-Eagle *Ichthyophaga humilis*, whose status in Kerala was uncertain, was sighted at five localities, from Parambikulam Tiger Reserve (10°25'N, 76°43'E) in the north to Shendurney Wildlife Sanctuary in the south; nine individual birds were seen. A pair of the Lesser Fish-Eagle was seen nesting at Umayar in Shendurney, proving it a breeding resident in Kerala. Interestingly, Grey-headed Fish-Eagle *I. ichthyaeetus* was not seen at all during the survey, despite it being considered a resident in Kerala (Ali 1969; Naoroji 2006; Sashikumar *et al.* 2011).

Density of birds in different habitats

We analysed the density of birds in different habitats. Moist-deciduous forest had the highest density of birds (296.2/km²) followed by Evergreen forests (163.26/km²). The modified habitats of Tea-shola-grassland complex of the Munnar region [47] had more than double the density (140.3 birds/km²) of natural habitats at the same elevation, namely, Shola, and Shola-grassland (61.8 birds/km²), but this was primarily due to the presence of habitat generalists such as crows, bulbuls, etc. In spite of the high detectability of birds, the Thorny scrub jungle at Aramboli (08°15' N, 77°15'E), Kanyakumari district had an extremely low bird diversity (93 species) as well as bird density (20.27 birds/km²). When compared to similar looking habitats at Masinagudi (Mudumalai Tiger Reserve) or Sathyamangalam Wildlife Sanctuary (Sashikumar, *pers. obs.*), this habitat had a high degree of avian species impoverishment. The cause of this deserves further investigation.



47. Grasslands at higher altitudes converted for tea and eucalyptus.

Changes in the status of some birds during 1933–2009

Wetland birds

The most striking change in status is that of the Cattle Egret *Bubulcus ibis*, which was recorded by Ali as, "noted sparingly along the railway line from Shoranúr to Chálakudi and the low country of Cochin generally," (Ali & Whistler 1937b) and not seen by him in Travancore at all. Ferguson (1903, 1904a, b, c) had recorded this species as common and Ali suspected that the change in population might have been due to persecution. The 2009 survey found this species to be common, and counted as many as 3259 birds from five wetlands.

The population of Little Cormorant *Phalacrocorax niger* has increased considerably: in 1933 Ali noted it only at Shoranur, not a single bird being seen in the Vembanad backwaters. But in 2009, 2343 cormorants were counted from 12 sites. Indian Shag *P. fuscicollis* and Great Cormorant *P. carbo* were recorded in 2009, but not in 1933.

There is change in the species composition of Anatidae in 2009: Spot-billed Duck *Anas poecilorhyncha*, Northern Shoveller *A. clypeata* and Northern Pintail *A. acuta* not recorded in 1933 survey, were seen in good numbers now.

Among the Rallidae, Purple Moorhen *Porphyrio porphyrio*, Common Coot *Fulica atra*, and Common Moorhen *Gallinula chloropus* were not recorded in 1933; these species, especially Purple Moorhen (2815 birds), were found in good numbers in 2009.

Birds of prey

Black Baza *Aviceda leuphotes*, Lesser Grey-headed Fish-Eagle, White-bellied Sea Eagle, Short-toed Snake-Eagle *Circaetus gallicus*, Crested Goshawk *Accipiter trivirgatus*, Eurasian Sparrow Hawk *A. nisus*, White-eyed Buzzard *Buteo teesa*, Common Buzzard *Buteo buteo*, Bonelli's Eagle *Hieraetus fasciatus*, Booted Eagle *H. pennatus*, Lesser Kestrel *Falco naumanni* and *Aquila* eagles, which were recorded in 2009, were not seen in 1933.

Disappearance of vultures

Vultures were not seen at all in 2009. Ali had recorded Long-billed Vulture *Gyps indicus*, Indian White-backed Vulture *G. bengalensis*, Red-headed Vulture *Sarcogyps calvus* and Egyptian Vulture *Neophron percnopterus* during the 1933 survey. He observed Egyptian Vulture at three locations, Long-billed-, and Red-headed vultures at five locations each, and Indian White-backed Vulture at four locations. On our interactions with the local people during the survey, we could understand that vultures disappeared about thirty years ago from most of these sites. According to the villagers of Marayur (10°17'N, 77°10'E), the main reason for the extinction of vultures in that locality was the poisoning by villagers of the left-over carcasses of cattle killed by tigers and leopards, to kill those carnivores. Vultures that fed on the poisoned carcasses might have died en masse, causing local extinction over the years. Scarcity of carcasses to feed, both in the wilderness, due to deforestation, poaching, etc., as well as of domestic animals, due to a general decline in cattle numbers, disposal of carcasses by burial instead of open disposal, and above all, increase in demand for consumable beef in Kerala, also could have caused the decline of vultures. More recently, the

problems caused by the veterinary drug Diclofenac, as proven elsewhere in India, could have decimated whatever remained of the vulture population in the Tamil Nadu plains on the eastern side of these localities.

Black Kite *Milvus migrans*

The distribution pattern of Black Kite seems to have undergone considerable change. Ali & Whistler (1937a) found this raptor, "generally distributed in the low country of Travancore and Cochin about towns and villages, and is also found on the hills (up to 5000 ft. !) [=1524 m] by human habitations." Black Kites were also seen in association with vultures at carcasses in 1933 (Ali & Whistler, 1937a). In 2009 it was recorded only at nine sites, whereas it was present at 15 sites in 1933. Now they seem to congregate in the larger towns attracted by the abundant garbage; c. 1500 birds were counted at a single roost in Trivandrum city in 2009.

Indian Peafowl *Pavo cristatus*

Indian Peafowl was not met with in the 1933 survey; but in 2009, it was recorded in ten out of 19 locations. This is an interesting development as the species usually occurs in dense scrub and deciduous forests (Ali 1969). Dispersal of Indian Peafowl to more areas points to the emergence of suitable drier conditions and open areas formerly not present in the southern Western Ghats. No other obvious reasons, e.g., change into agricultural crops, like groundnut, which attracts peafowl, could be detected.

House Swift *Apus affinis*

House Swift, described as, "... uncommon, patchily and capriciously distributed ..." by Ali & Whistler (1936c), was found to be common and widespread in 2009. Concrete buildings, dams, and bridges constructed all over Kerala since 1933 provide the species with enough suitable substrate to construct nests and this may be the reason for its present status.

Red-vented Bulbul *Pycnonotus cafer* a case of generalist species moving to higher altitudes

Regarding the status of Red-vented Bulbul, Ali & Whistler (1935a) commented, "... met it from about sea level to altitude 4000 ft (1219 m), but on the whole it would perhaps be correct to say that it avoids elevations over 1500–2000 ft (457–610 m) and also country that is densely wooded." There is a tremendous change in the distributional pattern of this bulbul now. The highest elevation at which we observed it was 2132 m during the present survey. At Padagari (600 m), where Ali had recorded it as "absent," its encounter rate was 135 birds/100 h in 2009. It was absent in Munnar in 1933, but we recorded an encounter rate of 60 birds/100 h. These instances point to the fact that this habitat generalist has moved up to higher elevations, which, sadly, indicates a great increase in the area of depleted habitats.

Status of the birds of Shola-grassland

Shola-grassland is a unique ecosystem in the Western Ghats that normally exists above 1800 m (Nair 1991). Over the years, these high altitude habitats of the High Ranges have been altered for monoculture plantations such as pine (*Pinus* sp.), eucalyptus (*Eucalyptus* sp.), etc. Anthropogenic factors like fire, agriculture, construction of tourism infrastructure, and dams and reservoirs

Photo: C. K. Vishnudas



47. Quarrying deep inside in the forest.

have so degraded and fragmented this habitat that today only a fraction of this ecosystem exists undisturbed, in its natural state. The bird community in this high altitude area also is unique with high endemism and presence of habitat specialists. The endemic Black-and-Orange Flycatcher, White-bellied Shortwing, and Grey-breasted Laughingthrush are common here. In Munnar, though large areas of prime shola forests had been cleared for tea and eucalyptus plantations, we found that good population of these birds survived in the relict shola patches. We found that the encounter rate of Grey-breasted Laughingthrush was higher (414 birds/100 h) in the undisturbed shola forest than in the disturbed shola patches (375 birds/100 h). The extent of Kannan Devan Tea Plantations in Munnar (Tata Tea) is 240 km² (www.kdhptea.com), which is more than three times the area of Eravikulam National Park. This clearly indicates the extent of loss of endemic bird habitat in south Kerala.

Conclusion

The Western Ghats region has been recognised as one of the important ecological hotspots of the world. During the survey, we came across evidence of extensive ecological damage that has taken place in the last seven decades. We found that large tracts of contiguous forests have become fragmented with smaller, isolated forest patches, without any connectivity in between. Generalist birds have started moving up to the high altitude habitats causing severe competition for endemic and specialist taxa. Uncontrolled tourism in high altitude area has become a major threat to endemic species. The ever increasing crowd population is a major threat to the survival of small birds. In most of the higher altitude grasslands where the survey was undertaken, annual fire was a regular feature, which is detrimental to grassland specialists. Many of the wetlands have been encroached for construction activities like land filling, and quarrying [48] takes place even deep inside the forest.

Acknowledgements

This survey was conceived and funded by the Kerala Forests & Wildlife Department, Government of Kerala. We offer our sincere thanks to them. Several ornithologists and birdwatchers helped us in all stages of the survey—while planning, in the field, and during the finalisation of the report. We are extremely grateful to all of them.

References

- Ali, S., 1953. *The birds of Travancore and Cochin*. 1st ed. Bombay: Oxford University Press. Pp. i–xx, 1–436.
- Ali, S., 1969. *Birds of Kerala*. 2nd ed. Bombay: Oxford University Press. Pp. i–xxiii, 1–444.
- Ali, S., & Whistler, H., 1935a. The ornithology of Travancore and Cochin. Part I. *Journal of the Bombay Natural History Society* 37 (4): 814–843.
- Ali, S., & Whistler, H., 1935b. The ornithology of Travancore and Cochin. Part II. *Journal of the Bombay Natural History Society* 38 (1): 61–92.
- Ali, S., & Whistler, H., 1935c. The ornithology of Travancore and Cochin. Part III. *Journal of the Bombay Natural History Society* 38 (2): 282–320.
- Ali, S., & Whistler, H., 1936a. The ornithology of Travancore and Cochin. Part IV. *Journal of the Bombay Natural History Society* 38 (3): 484–514.
- Ali, S., & Whistler, H., 1936b. The ornithology of Travancore and Cochin. Part V. *Journal of the Bombay Natural History Society* 38 (4): 759–790.
- Ali, S., & Whistler, H., 1936c. The ornithology of Travancore and Cochin. Part VI. *Journal of the Bombay Natural History Society* 39 (1): 3–35.
- Ali, S., & Whistler, H., 1937a. The ornithology of Travancore and Cochin. Part VII. *Journal of the Bombay Natural History Society* 39 (2): 320–342.
- Ali, S., & Whistler, H., 1937b. The ornithology of Travancore and Cochin. Part VIII. *Journal of the Bombay Natural History Society* 39 (3): 569–593.
- Bibby, C., Martin J., & Marsden, S., 1998. *Expedition field techniques—bird surveys*. The Expedition Advisory Centre, Royal Geographical Society, London.
- BirdLife International. 2014. Country profile: India. URL: <http://www.birdlife.org/datazone/country/india>. [Accessed on 16 February 2014].
- Buckland, S. T., Anderson, D. R., Burnham, K. P., Laake, J. L., Borchers, D. L., and Thomas, L., 2001. *Introduction to distance sampling*. Oxford University Press, Oxford.
- Fergusson, H. S., & Bourdillon, T. F., 1903. The birds of Travancore, with notes on their nidification. Part I. *Journal of the Bombay Natural History Society* 15 (2): 249–264.
- Fergusson, H. S., & Bourdillon, T. F., 1904a. The birds of Travancore, with notes on their nidification. Part II. *Journal of the Bombay Natural History Society* 15 (3): 455–474.
- Fergusson, H. S., & Bourdillon, T. F., 1904b. The birds of Travancore, with notes on their nidification. Part II. *Journal of the Bombay Natural History Society* 15 (4): 654–673.
- Fergusson, H. S., & Bourdillon, T. F., 1904c. The birds of Travancore, with notes on their nidification. Part III. *Journal of the Bombay Natural History Society* 16 (1): 1–18.
- Gibbons, D. W., & Gregory, R. D., 2006. Birds. In *Ecological Census Techniques- a Handbook*. William J. Sutherland, Cambridge University Press, Cambridge.
- Kinloch, A. P., 1921a. Rough notes on the avifauna of the Nelliampathy Hills. *Journal of the Bombay Natural History Society* 27 (4): 939–944.
- Kinloch, A. P., 1921b. The avifauna of the Nelliampathy Hills. *Journal of the Bombay Natural History Society* 28 (1): 279–280.
- Kinloch, A. P., 1923a. Further notes on the avifauna of the Nelliampathy Hills. (i) Nidification of the Great Malabar Black Wood Pecker [sic.] (*Thriponax hodgsoni*). (ii) Companionship between the South Indian Tree-Pie (*Dendrocitta leucogastra*) and the Greater Racket-tailed Drongo (*Dissemurmus paradiseus*). (iii) Occurrence of the Malay Bittern (*Gorsachius melanolophus*) in Southern India. *Journal of the Bombay Natural History Society* 29 (1): 294.
- Kinloch, A. P., 1923b. On the birds of the Nelliampathy Hills. *Journal of the Bombay Natural History Society* 29 (2): 564–565.
- Nair, S. C., 1991. *The Southern Western Ghats: a biodiversity conservation plan*. INTACH, New Delhi.
- Naoroji, R., 2006. *Birds of prey of the Indian Subcontinent*. 1st ed. New Delhi: Om Books International. Pp. 1–692.
- Robertson, A., & Jackson, M. C. A., 1992. *Birds of Periyar. An Aid to Birdwatching in Periyar Sanctuary, Kerala, S. India*. 1st ed. [Jaipur]: Tourism and Wildlife Society of India. Pp. i–xviii, 1–100.
- Sashikumar, C., Praveen J., Palot, M. J., & Nameer, P. O., 2011. *Birds of Kerala: status and distribution*. 1st ed. Kottayam, Kerala: DC Books. Pp. 1–835.
- Thomas, L., Laake, J. L., Strindberg, S., Marques, F. F. C., Buckland, S. T., Borchers, D. L., Anderson, D. R., Burnham, K. P., Hedley, S. L., Pollard, J. H., Bishop, J. R. B., & Marques, T. A., 2005. Distance 5.0. Release 4. Research Unit for Wildlife Population Assessment, University of St. Andrews, UK. Website: <http://www.ruwpa.st-and.ac.uk/distance/> [Accessed 01 July 2013]
- Website: www.kdhptea.com. [Accessed 12 December 2013]

Sl. No.	Species	Wadakkancheri	Nemmara	Padagiri	Kunhyarkutti	Karuppadama	Maraiyur	Munnar	Thattakkad	Santhanpara	Kumili	Peermade	Kottayam	Camp Deramalai	Rejampara	Tennalai	Trivandrum	Balamore Estate	Aramboli	Cape Comorin
65	Peregrine Falcon <i>F. peregrinus calidus</i>												X							
65a	Shaheen <i>F. peregrinus perigrinator</i>				X									X				X		
66	Grey Francolin <i>Francolinus pondicerianus</i>		X																X	X
67	Jungle Bush-Quail <i>Perdica asiatica</i>						X													
68	Painted Bush-Quail <i>P. erythrorhyncha</i>					X	X			X	X									
69	Red Spurfowl <i>Galloperdix spadicea</i>	X	X	X	X				X	X	X			X	X					
70	Grey Junglefowl <i>Gallus sonneratii</i>	X	X	X	X		X	X	X	X	X			X	X					
71	Indian Peafowl <i>Pavo cristatus</i>		X	X	X				X					X		X			X	X
72	Slaty-legged Crane <i>Rallina eurizonoides</i>								X											
73	Baillon's Crane <i>Porzana pusilla</i>																X			
74	White-breasted Waterhen <i>Amauornis phoenicurus</i>	X				X		X	X	X	X					X	X		X	X
75	Watercock <i>Gallix cinerea</i>												X							X
76	Purple Moorhen <i>Porphyrio porphyrio</i>					X							X				X		X	X
77	Common Moorhen <i>Gallinula chloropus</i>							X					X							X
78	Common Coot <i>Fulica atra</i>					X							X				X			X
79	Pheasant-tailed Jacana <i>Hydrophasianus chirurgus</i>					X							X						X	X
80	Bronze-winged Jacana <i>Metopidius indicus</i>		X			X			X				X						X	X
81	Pacific Golden-Plover <i>Pluvialis fulva</i>					X							X							X
82	Grey Plover <i>Pluvialis squatarola</i>												X							X
83	Little Ringed Plover <i>Charadrius dubius</i>	X				X					X		X							X
84	Kentish Plover <i>C. alexandrinus</i>					X							X							X
85	Lesser Sand Plover <i>C. mongolus</i>					X							X							X
86	Greater Sand Plover <i>C. leschenaultii</i>					X							X							X
87	Yellow-wattled Lapwing <i>Vanellus malabaricus</i>					X														
88	Grey-headed Lapwing <i>V. cinereus</i>												X							
89	Red-wattled Lapwing <i>V. indicus</i>	X	X		X	X	X	X			X	X	X			X				X
90	Pintail Snipe <i>Gallinago stenura</i>										X									
91	Common Snipe <i>G. gallinago</i>							X												
92	Black-tailed Godwit <i>Limosa limosa</i>												X							X
93	Eurasian Curlew <i>Numenius arquata</i>					X							X							
94	Common Redshank <i>Tringa totanus</i>					X							X							X
95	Marsh Sandpiper <i>T. stagnatilis</i>					X							X							
96	Common Greenshank <i>T. nebularia</i>					X							X							X
97	Green Sandpiper <i>T. ochropus</i>		X			X					X	X	X							
98	Wood Sandpiper <i>T. glareola</i>					X							X							X
99	Terek Sandpiper <i>Xenus cinereus</i>												X							X
100	Common Sandpiper <i>Actitis hypoleucos</i>					X		X	X		X		X				X		X	X
101	Ruddy Turnstone <i>Arenaria interpres</i>																			X
102	Sanderling <i>Calidris alba</i>					X							X							
103	Little Stint <i>C. minuta</i>												X							X
104	Black-winged Stilt <i>Himantopus himantopus</i>					X							X							X
105	Stone-Curlew <i>Burhinus oedicephalus</i>																			X
106	Small Pratincole <i>Glareola lactea</i>					X										X				
107	Heuglin's Gull <i>Larus heuglini</i>					X														
108	Pallas's Gull <i>L. ichthyaeus</i>					X														
109	Brown-headed Gull <i>L. brunnicephalus</i>					X							X							
110	Black-headed Gull <i>L. ridibundus</i>					X							X							X
111	Gull-billed Tern <i>Gelochelidon nilotica</i>					X							X							X
112	Caspian Tern <i>Hydroprogne caspia</i>																			X
113	River Tern <i>Sterna aurantia</i>	X	X						X		X					X				
114	Large Crested Tern <i>S. bergii</i>																			X
115	Common Tern <i>S. hirundo</i>					X														
116	Little Tern / Saunder's Tern <i>S. albifrons / saundersi</i>					X							X							
117	Whiskered Tern <i>Chlidonias hybridus</i>					X			X				X				X		X	X
118	Blue Rock Pigeon <i>Columba livia</i>		X			X	X	X				X	X		X	X	X			X
119	Nilgiri Wood-Pigeon <i>C. elphinstonii</i>			X			X	X		X	X							X		
120	Little Brown Dove <i>Streptopelia senegalensis</i>						X												X	X
121	Eurasian Collared-Dove <i>S. decaocto</i>																		X	X
122	Spotted Dove <i>S. chinensis</i>	X	X	X	X	X	X	X			X	X				X	X			X
123	Emerald Dove <i>Chalcophaps indica</i>	X	X	X	X		X	X	X	X	X			X	X	X	X	X		
124	Pompadour Green-Pigeon <i>Treron pompadora</i>	X	X	X	X		X	X	X	X	X			X	X	X	X			
125	Yellow-legged Green-Pigeon <i>T. phoenicoptera</i>	X	X																	
126	Green Imperial-Pigeon <i>Ducula aenea</i>					X			X											
127	Mountain Imperial-Pigeon <i>D. badia</i>			X	X				X	X	X	X	X	X	X	X		X		
128	Indian Hanging-Parrot <i>Loriculus vernalis</i>	X	X	X	X		X	X	X	X	X			X	X	X	X	X	X	
129	Rose-ringed Parakeet <i>Psittacula krameri</i>	X	X	X	X	X						X			X	X	X		X	X
130	Plum-headed Parakeet <i>P. cyanocephala</i>	X	X	X	X		X	X	X		X				X	X	X			

Sl. No.	Species	Wadakkancheri	Nemmara	Padagiri	Kuriyarkutti	Karuppadanna	Maraiyur	Munnar	Thattakkad	Santhanpara	Kumili	Peermade	Kottayam	Camp Deramalai	Rejampara	Tenmalai	Trivandrum	Balamore Estate	Aramboli	Cape Comorin
131	Blue-winged Parakeet <i>P. columboides</i>	X	X	X	X		X	X	X	X	X	X	X	X	X	X		X		
132	Pied Crested Cuckoo <i>Clamator jacobinus</i>					X													X	X
133	Red-winged Crested Cuckoo <i>C. coromandus</i>										X									
134	Large Hawk-Cuckoo <i>Hierococcyx sparverioides</i>										X					X				
135	Brainfever Bird <i>H. varius</i>	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X		X	
136	Indian Cuckoo <i>Cuculus micropterus</i>								X							X				
137	Banded Bay Cuckoo <i>Cacomantis sonneratii</i>	X			X				X		X	X			X	X			X	
138	Indian Plaintive Cuckoo <i>C. passerinus</i>						X	X	X											
139	Drongo Cuckoo <i>Sumiculus lugubris</i>	X							X		X				X			X		
140	Asian Koel <i>Eudynamis scolopacea</i>	X	X			X	X		X		X	X	X		X	X	X		X	X
141	Small Green-billed Malkoha <i>Phaenicophaeus viridirostris</i>	X	X		X		X												X	X
142	Sirkeer Malkoha <i>P. leschenaultii</i>						X													
143	Greater Coucal <i>Centropus sinensis</i>	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
144	Lesser Coucal <i>C. bengalensis</i>										X							X		
145	Barn Owl <i>Tyto alba</i>											X	X							
146	Oriental Scops-Owl <i>Otus sunia</i>			X	X					X	X			X						
147	Collared Scops-Owl <i>O. bakkamoena</i>		X		X				X	X	X	X						X		
148	Forest Eagle-Owl <i>Bubo nipalensis</i>						X													
149	Brown Fish-Owl <i>Ketupa zeylonensis</i>				X		X		X		X	X		X				X		
150	Mottled Wood-Owl <i>Strix ocellata</i>	X	X																	
151	Brown Wood-Owl <i>S. leptogrammica</i>																		X	
152	Jungle Owlet <i>Glaucidium radiatum</i>	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
153	Spotted Owlet <i>Athene brama</i>		X														X			X
154	Brown Hawk-Owl <i>Ninox scutulata</i>				X				X	X	X	X	X	X	X	X	X	X		
155	Ceylon Frogmouth <i>Batrachostomus moniliger</i>								X											
156	Great Eared-Nightjar <i>Eurostopodus macrotis</i>			X	X				X		X				X	X				
157	Indian Jungle Nightjar <i>Caprimulgus indicus</i>											X				X				
158	Jerdon's Nightjar <i>C. atripennis</i>		X		X				X							X				
159	Franklin's Nightjar <i>C. affinis</i>												X							
160	Indian Edible-nest Swittlet <i>Collocalia unicolor</i>		X	X	X		X		X		X				X	X		X		
161	White-rumped Needletail-Swift <i>Zoonavena sylvatica</i>			X	X		X	X	X		X	X	X	X	X	X				
162	Brown-backed Needletail-Swift <i>Hirundapus giganteus</i>			X	X		X	X		X	X	X	X	X	X	X		X		
163	Asian Palm-Swift <i>Cypsiurus balasiensis</i>	X	X		X				X		X	X			X	X	X		X	X
164	Alpine Swift <i>Tachymarpis melba</i>		X	X	X		X	X		X	X	X	X			X		X		X
165	Pacific Swift <i>Apus pacificus</i>				X															
166	House Swift <i>A. affinis</i>	X	X	X	X		X	X	X		X	X	X						X	X
167	Crested Tree-Swift <i>Hemiprocne coronata</i>	X	X	X			X	X	X	X	X	X			X	X				
168	Malabar Trogon <i>Harpactes fasciatus</i>	X	X	X	X		X		X	X	X	X			X	X		X		
169	Small Blue Kingfisher <i>Alcedo atthis</i>	X	X	X	X	X	X	X	X	X	X	X	X				X		X	X
170	Stork-billed Kingfisher <i>Halcyon capensis</i>	X	X	X	X	X	X	X	X	X	X	X	X		X	X				
171	White-breasted Kingfisher <i>H. smyrnensis</i>	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X
172	Black-capped Kingfisher <i>H. pileata</i>				X															
173	Lesser Pied Kingfisher <i>Ceryle rudis</i>	X				X			X		X		X				X		X	X
174	Blue-bearded Bee-eater <i>Nyctyornis athertoni</i>				X		X													
175	Small Bee-eater <i>Merops orientalis</i>	X	X			X	X		X								X		X	X
176	Blue-tailed Bee-eater <i>M. philippinus</i>				X	X			X				X							
177	Chestnut-headed Bee-eater <i>M. leschenaulti</i>	X	X	X	X		X	X	X		X	X	X	X	X	X			X	
178	Indian Roller <i>Coracias benghalensis</i>		X		X		X				X		X				X		X	X
179	Oriental Broad-billed Roller <i>Eurystomus orientalis</i>				X				X						X					
180	Common Hoopoe <i>Upupa epops</i>	X					X													X
181	Malabar Grey Hornbill <i>Ocycoerus griseus</i>	X		X	X			X	X	X	X	X	X	X	X	X		X		
182	Indian Grey Hornbill <i>O. birostris</i>		X																	
183	Malabar Pied Hornbill <i>Anthracoeros coronatus</i>				X															
184	Great Pied Hornbill <i>Buceros bicornis</i>			X	X					X				X	X	X		X		
185	Brown-headed Barbet <i>Megalaima zeylanica</i>				X		X												X	X
186	White-cheeked Barbet <i>M. viridis</i>	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
187	Crimson-throated Barbet <i>M. rubricapillus</i>	X	X	X	X		X	X	X	X	X	X	X	X	X	X		X		
188	Coppersmith Barbet <i>M. haemacephala</i>		X		X		X					X					X		X	X
189	Speckled Piculet <i>Picumnus innominatus</i>			X	X															
190	Brown-capped Pygmy Woodpecker <i>Dendrocopos nanus</i>	X	X	X	X		X	X	X		X	X		X	X					
191	Yellow-fronted Pied Woodpecker <i>D. mahrattensis</i>	X					X													
192	Rufous Woodpecker <i>Celeus brachyurus</i>	X	X	X	X				X		X			X	X	X				

Sl. No.	Species	Wadakkancheri	Nemmara	Padagiri	Kuriyarkutti	Karuppadanna	Maraiyur	Munnar	Thattakkad	Santhanpara	Kumili	Peermade	Kottayam	Camp Deramalai	Rajampara	Tennalai	Trivandrum	Balamore Estate	Aramboli	Cape Comorin
193	Great Black Woodpecker <i>Dryocopus javensis</i>								X	X	X				X					
194	Small Yellow-naped Woodpecker <i>Picus chlorolophus</i>		X	X	X		X		X		X	X		X	X	X				
195	Little Scaly-bellied Green Woodpecker <i>P. xanthopygaeus</i>	X					X	X	X											
196	Common Golden-backed Woodpecker <i>Dinopium javanense</i>	X		X	X		X		X	X	X			X	X	X		X		
197	Lesser Golden-backed Woodpecker <i>D. benghalense</i>	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X		X
198	Black-shouldered Woodpecker <i>Chrysocolaptes festivus</i>						X													
199	Greater Golden-backed Woodpecker <i>C. lucidus</i>	X	X	X	X		X	X	X		X	X		X		X		X		
200	Heart-spotted Woodpecker <i>Hemicircus canente</i>	X	X	X	X		X	X	X	X	X				X	X		X		
201	Indian Pitta <i>Pitta brachyura</i>		X				X		X	X	X				X	X				
202	Jerdon's Bush-Lark <i>Mirafra affinis</i>				X		X												X	X
203	Ashy-crowned Sparrow-Lark <i>Eremopterix grisea</i>																			X
204	Eastern Skylark <i>Alauda gulgula</i>									X	X	X	X					X		X
205	Eurasian Crag-Martin <i>Hirundo rupestris</i>						X													
206	Dusky Crag-Martin <i>H. concolor</i>		X	X	X		X	X	X		X	X		X		X		X		
207	Common Swallow <i>H. rustica</i>				X	X	X				X	X	X		X	X			X	X
208	House Swallow <i>H. tahitica</i>			X			X	X										X		
209	Wire-tailed Swallow <i>H. smithii</i>									X			X							
210	Red-rumped Swallow <i>H. daurica</i>		X	X	X	X	X	X	X	X	X	X	X	X	X	X			X	X
211	Northern House-Martin <i>Delichon urbica</i>								X		X								X	X
212	Forest Wagtail <i>Motacilla indicus</i>		X	X	X				X					X	X	X				X
213	White Wagtail <i>M. alba</i>												X							
214	Large Pied Wagtail <i>M. maderaspatensis</i>	X	X		X	X	X	X	X		X	X	X	X	X	X	X		X	X
215	Citrine Wagtail <i>M. citreola</i>																X			
216	Yellow Wagtail <i>M. flava</i>					X							X				X			X
217	Grey Wagtail <i>M. cinerea</i>	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
218	Richard's Pipit <i>Anthus richardi</i>										X									
219	Paddyfield Pipit <i>A. rufulus</i>				X	X	X	X		X	X	X		X		X		X		X
220	Brown Rock Pipit <i>A. similis</i>																X	X		
221	Nilgiri Pipit <i>A. nilghiriensis</i>						X	X									X	X		
222	Large Cuckoo-Shrike <i>Coracina macei</i>	X	X	X	X		X		X		X	X			X	X				
223	Black-headed Cuckoo-Shrike <i>C. melanoptera</i>	X	X		X		X		X		X				X					
224	Small Minivet <i>Pericrocotus cinnamomeus</i>	X	X		X		X	X	X		X			X	X	X				
225	Scarlet Minivet <i>P. flammeus</i>	X	X	X	X		X	X	X	X	X			X	X	X				
226	Pied Flycatcher-Shrike <i>Hemipus picatus</i>	X	X	X	X		X	X	X	X	X			X	X	X				
227	Large Woodshrike <i>Tephrodornis gularis</i>	X	X	X	X		X		X	X	X			X	X	X				
228	Common Woodshrike <i>T. pondicerianus</i>	X	X				X		X					X	X				X	X
229	Grey-headed Bulbul <i>Pycnonotus priocephalus</i>			X	X		X		X		X			X	X	X				
230	Ruby-throated Bulbul <i>P. melanicterus gularis</i>	X	X	X	X		X		X		X			X	X	X				
231	Red-whiskered Bulbul <i>P. jocosus</i>	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
232	Red-vented Bulbul <i>P. cafer</i>	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
233	White-browed Bulbul <i>P. luteolus</i>	X	X		X		X												X	X
234	Yellow-browed Bulbul <i>Hypsipetes indicus</i>	X	X	X	X		X	X	X	X	X			X	X	X				
235	Black Bulbul <i>H. leucocephalus</i>			X	X		X	X		X	X			X	X	X				
236	Common Iora <i>Aegithina tiphia</i>	X	X	X	X		X		X	X	X	X	X	X	X	X	X		X	X
237	Jerdon's Chloropsis <i>Chloropsis cochinchinensis</i>	X	X				X		X											
238	Gold-fronted Chloropsis <i>C. aurifrons</i>	X	X	X	X		X		X		X	X	X	X	X	X				
239	Asian Fairy-Bluebird <i>Irena puella</i>	X	X	X	X		X		X		X	X	X	X	X	X				
240	Brown Shrike <i>Lanius cristatus cristatus</i>		X	X	X	X	X	X	X	X	X	X	X	X	X	X				X
240a	Philippine Shrike <i>L. cristatus lucionensis</i>		X		X				X					X						
241	Bay-backed Shrike <i>L. vittatus</i>					X	X												X	X
242	Rufous-backed Shrike <i>L. schach</i>						X	X	X	X		X								
243	Blue-headed Rock-Thrush <i>Monticola cinclorhynchus</i>	X		X	X		X	X	X			X								
244	Blue Rock-Thrush <i>M. solitarius</i>			X								X								
245	Malabar Whistling-Thrush <i>Myiophonus horsfieldii</i>	X	X	X	X		X	X	X	X	X			X	X	X				X
246	White-throated Ground Thrush <i>Zoothera citrina cyanotus</i>	X	X	X	X		X	X	X		X	X		X	X	X				
247	Scaly Thrush <i>Zoothera dauma</i>						X													
248	Eurasian Blackbird <i>Turdus merula nigropileus</i>	X		X	X		X	X	X	X	X			X						
248a	Bourdillon's Blackbird <i>T. merula bourdilloni</i>			X			X	X		X	X									X
249	White-bellied Shortwing <i>Brachypteryx major albiventris</i>						X	X		X	X					X				X

Sl. No.	Species	Wadakkancheri	Nemmara	Padajiri	Kuriyakutti	Karuppadamma	Maraiyur	Munnar	Thattakkad	Santhanpara	Kumili	Peermade	Kottayam	Camp Deramalai	Rejampara	Tenmalai	Trivandrum	Balamore Estate	Aramboli	Cape Comorin
250	Indian Blue Robin <i>Luscinia brunnea</i>		X		X		X	X		X	X	X		X	X					
251	Oriental Magpie-Robin <i>Copsychus saularis</i>	X	X	X	X	X	X		X	X	X	X	X		X	X	X		X	X
252	White-rumped Shama <i>C. malabaricus</i>				X		X													
253	Indian Robin <i>Saxicoloides fulicata</i>		X			X	X												X	X
254	Pied Bushchat <i>Saxicola caprata</i>			X			X	X		X	X	X								
255	Wynaad Laughingthrush <i>Garrulax delesserti</i>				X									X						
256	Grey-breasted Laughingthrush <i>G. jerdoni fairbanki</i>						X	X		X	X									
256a	Blanford's Laughingthrush <i>G. jerdoni meridionale</i>															X		X		
257	Spotted Babbler <i>Pellorneum ruficeps</i>	X	X	X	X		X		X	X	X	X		X	X	X		X	X	
258	Indian Scimitar-Babbler <i>Pomatorhinus horsfieldii</i>		X	X	X		X	X	X	X	X	X		X	X	X		X		
259	Rufous-bellied Babbler <i>Dumetia hyperythra</i>		X		X		X					X								
260	Black-headed Babbler <i>Rhopocichla atriceps</i>	X		X	X				X	X	X	X			X	X		X		
261	Yellow-eyed Babbler <i>Chrysomma sinense</i>						X													
262	Indian Rufous Babbler <i>Turdoides subrufus</i>	X		X	X		X	X	X	X	X	X			X	X		X		
263	Jungle Babbler <i>T. striatus</i>	X	X	X	X		X	X	X	X	X	X			X	X				
264	White-headed Babbler <i>T. affinis</i>	X	X		X		X		X							X	X		X	X
265	Quaker Tit-Babbler <i>Alcippe poioicephala</i>	X		X	X		X	X	X	X	X	X		X	X	X		X		
266	Streaked Fantail-Warbler <i>Cisticola juncidis</i>					X	X				X	X	X			X	X			
267	Franklin's Prinia <i>Prinia hodgsonii</i>	X		X	X				X		X	X						X		
268	Jungle Prinia <i>P. sylvatica</i>						X												X	
269	Ashy Prinia <i>P. socialis</i>					X	X				X		X	X				X		
270	Plain Prinia <i>P. inornata</i>					X	X	X	X	X	X	X							X	
271	Pale Grasshopper-Warbler <i>Locustella naevia</i>										X	X								
272	Paddyfield Warbler <i>Acrocephalus agricola</i>							X												
273	Blyth's Reed-Warbler <i>A. dumetorum</i>	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X		X
274	Indian Great Reed-Warbler <i>A. stentoreus</i>					X			X		X	X								
275	Thick-billed Warbler <i>A. aedon</i>	X		X			X	X								X				X
276	Common Tailorbird <i>Orthotomus sutorius</i>	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
277	Tickell's Warbler <i>Phylloscopus affinis</i>			X	X		X	X		X	X	X				X				
278	Greenish Leaf-Warbler <i>P. trochiloides</i>	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	
279	Large-billed Leaf-Warbler <i>P. magnirostris</i>	X	X	X	X		X	X	X	X	X	X			X	X		X		
280	Tytler's Leaf-Warbler <i>P. tytleri</i>						X	X				X								
281	Western Crowned Leaf-Warbler <i>P. occipitalis</i>			X	X		X	X		X	X	X								
282	Broad-tailed Grass-Warbler <i>Schoenicola platyura</i>						X				X	X						X		
283	Asian Brown Flycatcher <i>Muscicapa latirostris</i>	X	X	X	X		X		X		X	X	X	X	X	X				
284	Rusty-tailed Flycatcher <i>M. ruficauda</i>	X		X	X		X		X		X				X	X				
285	Brown-breasted Flycatcher <i>M. muttui</i>	X	X	X	X		X	X	X		X	X			X					
286	Red-throated Flycatcher <i>Ficedula parva</i>				X				X											
287	Black-and-Orange Flycatcher <i>F. nigrorufa</i>						X	X		X	X									
288	Verditer Flycatcher <i>Eumyias thalassina</i>	X		X	X		X		X		X									
289	Nilgiri Flycatcher <i>E. albicaudata</i>						X	X		X	X									
290	White-bellied Blue-Flycatcher <i>Cyornis pallipes</i>				X	X	X		X	X	X				X	X		X		
291	Blue-throated Flycatcher <i>C. rubeculoides</i>	X	X	X	X		X		X		X				X	X				
292	Tickell's Blue-Flycatcher <i>C. tickelliae</i>	X	X	X	X		X		X		X				X	X				
293	Grey-headed Flycatcher <i>Culicicapa ceylonensis</i>			X			X	X		X				X		X		X		
294	Asian Paradise-Flycatcher <i>Terpsiphone paradisi</i>	X	X	X	X		X		X		X	X	X	X	X	X		X		X
295	Black-naped Monarch-Flycatcher <i>Hypothymis azurea</i>	X	X	X	X		X		X	X	X	X			X	X		X		
296	White-browed Fantail-Flycatcher <i>Rhipidura aureola</i>		X				X													
297	Great Tit <i>Parus major</i>	X	X	X	X		X		X		X				X	X				
298	Black-lored Yellow Tit <i>P. xanthogenys</i>			X	X		X			X	X			X						
299	Velvet-fronted Nuthatch <i>Sitta frontalis</i>		X	X	X		X	X	X	X	X			X	X	X		X		
300	Thick-billed Flowerpecker <i>Dicaeum agile</i>						X		X						X					
301	Tickell's Flowerpecker <i>D. erythrorhynchos</i>	X	X		X	X	X					X					X		X	X
302	Plain Flowerpecker <i>D. concolor</i>	X		X	X		X	X	X	X	X	X		X	X	X		X		
303	Purple-rumped Sunbird <i>Nectarinia zeylonica</i>	X	X	X	X	X	X		X		X		X				X		X	
304	Small Sunbird <i>N. minima</i>	X	X	X	X		X	X	X	X	X	X		X	X	X		X	X	
305	Purple Sunbird <i>N. asiatica</i>	X	X	X	X	X	X	X	X	X	X	X		X	X	X		X	X	X
306	Loten's Sunbird <i>N. lotenia</i>	X					X		X	X	X		X	X	X	X		X		
307	Little Spiderhunter <i>Arachnothera longirostris</i>		X	X	X			X	X	X	X	X			X	X	X	X		
308	Oriental White-eye <i>Zosterops palpebrosus</i>			X	X		X	X		X	X	X		X		X		X		
309	Common Rosefinch <i>Carpodacus erythrinus</i>		X	X			X	X	X	X	X									
310	Red Munia <i>Amandava amandava</i>					X														
311	White-rumped Munia <i>Lonchura striata</i>	X	X		X		X													
312	Black-throated Munia <i>L. kelaarti</i>		X	X			X	X	X	X		X						X		
313	Spotted Munia <i>L. punctulata</i>		X				X													
314	Black-headed Munia <i>L. malacca</i>					X			X			X					X			

Sl. No.	Species	Wadakkancheri	Nemmara	Padajini	Kuriyarkutti	Karuppadaanna	Maraiyur	Munnar	Thattakkad	Santhanpara	Kumili	Peermade	Kottayam	Camp Deramalai	Rajampara	Tennalai	Trivandrum	Balamore Estate	Aramboli	Cape Comorin	
315	House Sparrow <i>Passer domesticus</i>						X	X			X	X									X
316	Yellow-throated Sparrow <i>Petronia xanthocollis</i>					X	X						X							X	X
317	Streaked Weaver <i>Ploceus manyar</i>					X							X								
318	Baya Weaver <i>P. philippinus</i>					X							X				X		X	X	
319	Grey-headed Starling <i>Sturnus malabaricus malabaricus</i>			X			X		X		X		X	X		X					
319a	Blyth's Starling <i>Sturnus malabaricus blythi</i>	X	X	X	X				X		X	X		X	X	X		X			
320	Brahminy Starling <i>S. pagodarum</i>																				X
321	Rosy Starling <i>S. roseus</i>					X	X						X								
322	Common Myna <i>Acridotheres tristis</i>	X	X	X	X	X	X		X				X		X	X	X			X	X
323	Jungle Myna <i>A. fuscus</i>					X	X	X	X		X	X	X		X	X	X			X	X
324	Southern Hill-Myna <i>Gracula indica</i>	X	X	X	X			X	X	X	X	X		X	X	X		X			
325	Indian Golden Oriole <i>Oriolus kundoo</i>	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X					X
326	Black-naped Oriole <i>O. chinensis</i>	X	X	X	X	X	X		X				X		X	X					
327	Black-headed Oriole <i>O. xanthornus</i>	X	X		X	X	X		X		X	X	X		X	X	X				
328	Black Drongo <i>Dicrurus macrocercus</i>	X	X	X		X			X		X	X		X	X	X			X	X	
329	Ashy Drongo <i>D. leucophaeus</i>	X	X	X	X		X	X	X	X	X			X	X	X	X				
330	White-bellied Drongo <i>D. caeruleus</i>	X			X	X															
331	Bronzed Drongo <i>D. aeneus</i>	X	X	X	X	X	X		X		X	X		X	X	X		X			
332	Spangled Drongo <i>D. hottentottus</i>	X																			
333	Greater Racket-tailed Drongo <i>D. paradiseus</i>	X	X	X	X		X		X	X	X	X	X	X	X	X		X			
334	Ashy Woodswallow <i>Artamus fuscus</i>	X	X			X	X		X	X	X	X	X		X	X	X	X	X	X	X
335	Indian Treepie <i>Dendrocitta vagabunda</i>	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			X	X
336	White-bellied Treepie <i>D. leucogastra</i>			X	X		X		X		X	X		X	X	X			X		
337	House Crow <i>Corvus splendens</i>		X		X	X	X	X	X		X	X	X		X	X	X			X	X
338	Jungle Crow <i>C. macrorhynchos</i>	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Total number of species	124	137	130	158	112	180	114	166	96	185	138	127	93	118	146	73	94	93	120	

In memoriam
James Channabasappa Uttangi
1916 – 2014

For bibliography of ornithological work, please visit:

http://www.southasiaornith.in/search.php?bib_search_type=&bib_search_list=AU&bib_search_word=uttangi&search_bib=Search