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Prakash

Birds of Chagos
Urban birds
Bean Goose



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Acrylic on Canvas | 17" x 13" | July 2015

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Collection of Bikram Grewal

BACK COVER: Narcondam Hornbill *Rhyticeros narcondami*

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Birds of the British Indian Ocean Territory, Chagos Archipelago, central Indian Ocean

Peter Carr

Carr, P., 2015. Birds of the British Indian Ocean Territory, Chagos Archipelago, central Indian Ocean. *Indian BIRDS* 10 (3&4): 57–70.
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Introduction

The Chagos Archipelago lies at the end of the Chagos-Laccadive Ridge and is some 500km due South of the Maldives archipelago. It is the final termini for migrating organisms heading South in the central Indian Ocean. It is made up of five islanded atolls centred upon the Great Chagos Bank, the largest atoll structure in the world. The climate is tropical oceanic, hot and humid yet moderated by trade winds. Mean monthly temperatures vary from a maximum of 30.75°C in March to a minimum of 28.03°C in August. The northern atolls of the archipelago are the wettest in the Indian Ocean (Stoddart & Taylor 1971).

The entire archipelago is given over to defence purposes and access is severely restricted (http://www.jncc.defra.gov.uk/pdf/of_biot/pdf accessed 19 July 2015). The history of the Chagos Archipelago, also called the British Indian Ocean Territory (BIOT – hereafter referred to as the Chagos), is out with the scope of this article, further reading on this United Kingdom Overseas Territory's past can be found in the likes of Scott (1963), Edis (1994), Vine (2009) and, Wenban-Smith & Carter (in press). The archipelago and surrounding seas were designated in 2010 as a Marine Protected Area by the British Government, at 640,000km² it is the largest no-take marine reserve in the world. There is a RAMSAR site based upon the largest island of Diego Garcia (http://www.jncc.defra.gov.uk/pdf/of_biot/pdf accessed 19 July 2015).

Young in geological terms, exceedingly remote, flat and truly oceanic having never been connected to a mainland, as would be expected the native terrestrial biodiversity is impoverished. For example, there are no native mammals, extraordinarily this includes bats (Carr 2011a), less than 50 species of native higher plant (Topp & Sheppard 1999) and only two native reptiles (Mortimer & Day 1999). To date, on land only one full species, a moth, has been classified as endemic (Barnett & Emms 1999). The seas of the archipelago are assessed as some of the cleanest in the world and the associated coral reefs are used by scientists as a template for what coral reefs that have suffered little anthropogenic disturbance should look like (Koldewey *et al* 2010; Sheppard *et al* 2013). The story on land is very different. As has happened globally, man's arrival on the islands (in the late 1700's) wrought ecological disaster, primarily through native forest being cleared and the introduction of alien species. In addition to humans, introduced rats, cats, dogs and hogs decimated avian populations, in particular the once abundant breeding seabirds (Bourne 1971).

Bourne (1971) stated that, "The Chagos group occupy a strategic position, not only militarily but ornithologically. They are isolated in the remotest possible position in the tropical Indian Ocean, in a situation lying in the path of both landbird vagrants

from three directions, the east, north and west and seabird migrants from four, the north and south and dispersing east and west along the equatorial counter current systems." Observations post-1971 have proven that Bourne's words were prophetic; landbird and seabird vagrants and migrants are an exciting aspect of birding in the Chagos. The vast majority of migratory species are of northern hemisphere origin (though there is evidence that a limited number of vagrants are from the east and west) and are generally present in the archipelago from September through to March. As more ornithological research is conducted in to seabirds at sea in the Chagos, east–west passage migrants such as Matsudaira's Storm-petrel *Oceanodroma matsudairae* are being recognised as regular at certain times of the year, as are southern hemisphere winter visitors such as Wilson's Storm-petrel *Oceanites oceanicus* (Carr 2014).

In addition to the migrants and vagrants are 18 species of breeding seabirds (Carr 2011a; Carr *et al.* 2013) of which five are in sufficient numbers to qualify 12 islands for IUCN categorised Important Bird Area status (Carr 2006; McGowan *et al.* 2008). It has been proposed that the single island IBA classification for the Chagos be amended to clusters of islands due to the most abundant breeding seabird, Sooty Tern *Onychoprion fuscatus*, periodically deserting islands due to infestations of avian ticks (Carr 2011b; Carr *et al.* 2013).

There is also a small number of resident breeding land-birds that are made up of natural colonists whose origins and present taxonomical status is of interest, and of introduced exotics, the provenance and taxonomic status of which is a matter of some debate.

Between 2005 and 2013 there was an unprecedented amount of bird recording in the archipelago as there were two active ornithologists resident on Diego Garcia, and a number of scientific expeditions had been granted permission to visit the area (Carr 2011a, 2014). This heightened activity resulted in over 25 species new to the Chagos being recorded, most with accompanying confirmatory photographs.

The aim of this article is to discuss species that occur in the Chagos that may be of interest to birders in the Indian Subcontinent.

Potential weather influences

It is of note that the weather pattern in the Chagos could influence the time of arrival of any vagrant from the Chagos to the north. Between October and April, when the majority of species are at the peak of breeding, winds are light or moderate, and generally from the north-west. Between December and February the Inter-Tropical Convergence Zone (ITCZ) is either over, or just south of, the Chagos, then it moves north. For the rest of the year, the

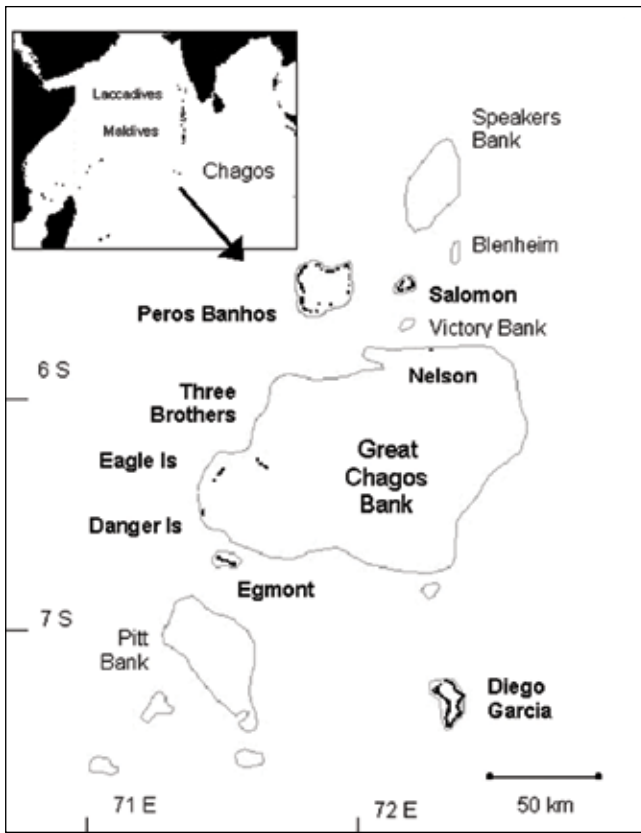


Fig. 1. The Chagos Archipelago.

south-eastern trades blow strongly, and potentially these could bring inexperienced young birds north.

General information

The recording area used for the Chagos in this article is as defined in Carr (2011a) and loosely encompasses the BIOT Economic Exclusion Zone from 02°–11°S, 68°–76°W. Nomenclature follows Dickinson & Remsen (2013) for non-passerines and Dickinson & Christidis (2014) for passerines. The Appendix provides a tabulated reference to all birds that have claimed to have been recorded in the region.

Species accounts: Migrants & vagrants

Australian Shelduck *Tadorna tadornoides*

Australian Shelduck [50] is restricted as a breeding species to southern Australia, though is expanding its range and has recently bred in New Zealand. It is noted for its vagrancy and has been recorded on many oceanic islands including Raoul Island and Kermadec Islands in the Pacific some 3000 km from Australia (<http://nzbirdsonline.org.nz>; accessed on 13 February 2015). Of the Chagos, Guzman (2003) reports "Five juveniles...in Sept 2002. A month later, I saw and took pictures of the two adult pairs." Photographs of these birds have been published (Carr 2011a) and there is no doubt as to the authenticity of the record. How these birds arrived on Diego Garcia, some 4700 km from the west coast of Australia is a mystery, however, with their preponderance for oceanic vagrancy it does not appear unrealistic to assume they arrived under their own steam. Further, it is hard to imagine a small flock of ducks stowing away on a ship, and sea



50. Australian-Shelducks

passages between Australia and Diego Garcia are very seldom undertaken. This suspected vagrancy has implications for Indian birders as, had these birds not found sanctuary at sewage works in the Chagos, their next north-bound stop could have been either the Maldives or the southern Indian coast.

Tahiti Petrel *Pseudobulweria rostrata*

Pterodroma petrels should be expected in the northern Indian Ocean, especially Barau's Petrel *P. barau* (Stahl & Bartle 1991; van den Berg *et al.* 1991; Praveen *et al.* 2013), and the "Round Island Petrel" *Pterodroma* sp. Unpublished tracking data of birds from Round Island, Mauritius, has demonstrated that birds from this island move far and wide across the Indian Ocean; and the Atlantic and Pacific (Nicoll, Zoological Society of London, *pers.*



51. Tahiti Petrel

comm.). Carr (2014) photographed a *Pterodroma* petrel in the Chagos on 23 November 2012 that was identified as a Tahiti Petrel [51], this was later confirmed by Capt. Neil Cheshire and Dr. Charles Anderson. Definite and probable sightings in the Indian Ocean of this vagrant from the Pacific are increasing, and it may only be a matter of time before it is added to the Indian bird checklist.

Shearwater species *Puffinus* sp.

A single small *Puffinus* shearwater was photographed in flight near Nelson's Island on the northern rim of the Great Chagos Bank on 04 April 2015. The bird was noticeably browner and had a more extensive collar (saddlebags) than the local breeding Tropical Shearwater. At the time of writing the identity of this bird is still being discussed though Persian Shearwater *Puffinus persicus* is emerging as a strong candidate.

Bulwer's Petrel *Bulweria bulwerii*

An increase in dedicated pelagic expeditions in the Chagos since 2012 has revealed the Bulwer's Petrel [52] to be not uncommon there in the northern hemisphere winter months. For example, ten individual birds were recorded through 21–29 November 2012 (Carr 2014) and a further seven during 10–25 January 2015 [Carr, Zoological Society of London (henceforth, ZSL), unpublished].

Jouanin's Petrel *Bulweria fallax*

Despite distribution maps, in Harrison (1983), and Onley & Scofield (2007), indicating that this species occurs in or near the Chagos, there are only two records to date. A January 1960 record exists in Bourne (1971), and Carr (2014) claims a second bird sighted on 01 August 2014. Either the species is being under-recorded / misidentified or it remains further west in the



Photos: Peter Carr

52. Bulwer's Petrel



53. Matsudaira's Storm-petrel

central Indian Ocean than the published literature suggests.

White-faced Storm-petrel *Pelagodroma marina*

A distinctive species that is similar to the previous one, the literature suggests it should be recorded in Chagos waters. To date there are four records, the last being on 26 November 2012 (Carr 2014). It is unlikely this species is being missed or misidentified in the Chagos and the lack of records is attributable to either the lack of pelagic recording or, it does not transit through or disperse to the central Indian Ocean.

Black-bellied Storm-petrel *Fregetta tropica*

Onley & Scofield (2007) give the distribution of this southern hemisphere breeder as Indian Ocean-wide in the non-breeding season. There remains a single record in Chagos waters from June 1964 (Bourne 1971). Despite the limited *dedicated* pelagic recording, the author has undertaken numerous transits (30+) from Diego Garcia to the northern atolls on the BIOT Patrol Vessel since 2008, it is safe to state that this species is at least, extremely rare in Chagos waters.

Matsudaira's Storm-petrel *Oceanodroma matsudaira*

The recent upsurge in pelagic expeditions in the Chagos has revealed this species [53] to be present in at least November with a minimum of 30 individual birds sighted through 21–26 November 2012. Of interest, 25 of these birds were associated with seamounts, and the remaining five were recorded above a shallow bank (Carr 2014). As these particular marine habitats are seldom visited by ornithologists in the Chagos it remains to be ascertained whether these birds only transit through the central Indian Ocean to and from breeding grounds in the Pacific and

wintering grounds off Africa, as commonly believed (Onley & Scofield 2007) or, if they remain in the Chagos for at least some of the non-breeding season, associating with specific marine upwelling areas. No storm-petrels of any species were recorded over the same sites in January 2015 (Carr, ZSL, unpubl.).

Dimorphic Egret *Egretta garzetta dimorpha*

Appendix F2 a. of the Diego Garcia Integrated Natural Resources Management Plan (DGINRMP 2005) under the heading for this species states, "This is the first record of the dimorphic egret at Diego Garcia [sic]. A single individual was observed and photographed on 1 February 1995 at the sand pit. The most notable item about this sighting is that the bird is banded (ringed)". The caption has an accompanying photograph and can be viewed at www.zianet.com/tedmorris/dg/2005NRMP-Appendixf-birdsandmammals.pdf. The defunct website www.worldbirds.com holds a further series of records, probably relating to a long-staying individual on Diego Garcia between October 2009 and March 2011. In view of the taxonomic uncertainty of this species, the difficulty of positively identifying this species group out of breeding plumage, and the African distribution of this subspecies and therefore, an unlikely candidate for vagrancy to the central Indian Ocean, it is wise to leave these records as unconfirmed.

Christmas Frigatebird *Fregata andrewsi*

There have been a series of sightings of suspected juvenile Christmas Frigatebirds from the Chagos since 2009 (Carr. ZSL. pers. obs.). Photographs of these birds have been circulated amongst frigatebird experts, including David J. James (see James 2004). The verdict on the identification of these birds has never been conclusive (though the majority opted for Christmas Frigatebird in all cases), and therefore this species remains as a "possible" in the Chagos. In view of its vagrancy in the Indian Ocean it remains a very strong candidate for a positive sighting.

Lanner Falcon *Falco biarmicus*

There is a report of a pair (sic) of Lanner Falcon being present on Diego Garcia for at least two days in February 2002 (Editor's Note in Guzman 2003). These birds were photographed, but to date the photographs have not been traced. Lanner Falcon migrates locally in West Africa and tend towards nomadism in the east and south of its range (Ferguson-Lees & Christie 2001); therefore it is not a strong candidate for vagrancy to the central Indian Ocean. However, one of the finders of these birds was a part-time falconer, another was a credible and published botanist with a thorough understanding of the requirements of identification and to the significance of this record; therefore it is presumed that this record is correct. What is not known is the provenance of these birds. It appears unlikely that they were escaped falconry birds due to the absence of jesses; ship-assistance is also unlikely due to the lack of traffic through the Chagos. However unlikely, all factors point towards these birds being genuine vagrants.

European Honey-buzzard *Pernis apivorus*

There are two records of this species [54] from the Chagos probably relating to the same bird. The first encounter was on 20 September 2012, the second on 22 October 2012. Both



54. European-Honey Buzzard

sightings were from the same area on the main island of Diego Garcia. Photographs of this bird were shared for identification purposes (Carr 2014). There are seven records to date from the Seychelles (SBRC 2015), not unexpected, being further west and closer to this species' migration routes. There are no records from the Maldives (Anderson 2011, and records therein), possibly suggesting this is an unlikely candidate in India.

Oriental Plover *Charadrius veredus*

A well-photographed juvenile was present on Diego Garcia from 18 September to 14 November 2012 (Carr 2014). Perhaps, surprisingly, this species [55] has not been recorded in the Maldives (Anderson 2011, and records therein); yet there are five records for the Seychelles (SBRC 2015). Breeding in northern China, and wintering in Indonesia and northern Australia



55. Oriental Plover



56. Far Eastern Curlew

(Hayman *et al.* 1986) this highly migratory species is prone to vagrancy, e.g., Thailand (Ogle 1992), and therefore was not totally unexpected in the Chagos.

Far Eastern Curlew *Numenius madagascariensis*

A single bird [56] of this IUCN classified Vulnerable species was present on Diego Garcia through 04–06 November 2007 (Carr 2011a). Breeding in eastern Russia, and wintering mainly in Australia, this species has been recorded west to Thailand, Vietnam, Malaysia, and Singapore (BirdLife International 2015). Although seemingly prone to westerly vagrancy, the scarcity

of this species makes it an unlikely candidate to be recorded outside of known migration routes and stopovers.

Grey-tailed Tattler *Heteroscelus brevipes*

Since the first record of this IUCN classified Near-threatened species [57] in 1995 (DG INRMP 2005), there have been a further six from throughout the year, all on Diego Garcia (Carr 2011a, 2014). These oceanic island vagrants to the central Indian Ocean are consistent with this species' known extraordinary wanderings (Van Giles *et al.* 2014b).

Red-necked Stint *Calidris ruficollis*

Carr (2011a) gives the details of the historic claims of this species in the Chagos, only one of which has been deemed to have enough supporting evidence to have been accepted as "beyond reasonable doubt," due to the difficulties of identification in anything other than breeding plumage. The only record with confirmatory photographs is of a single bird on Diego Garcia on 12 November 2009. Breeding in north-eastern Siberia and northern and western Alaska, with a migration route along the East Asian–Australasian Flyway to Australia (BirdLife International 2015), this species is prone to vagrancy and should be expected in both, the Chagos, and India.

Long-toed Stint *Calidris subminuta*

There are now double figure records of this distinctive little wader in the Chagos, all from Diego Garcia, and all during the northern hemisphere winter months. The earliest migrant was found on 20 September 2011, the latest on 08 April 2010. Given that part of the breeding population winters in eastern India, and Sri Lanka, and some birds migrate overland to South-east Asian, and Philippine wintering grounds (Van Giles & Wiersma 1996), vagrants to the Chagos are unsurprising.



Photos: Peter Carr

57. Grey-tailed Tattler



58. Pectoral Sandpiper

Pectoral Sandpiper *Calidris melanotos*

Up to six birds [58] have been found and well photographed on Diego Garcia between 2007 and 2012; the earliest on 14 October 2012, and the latest on 20 January 2009. It is surprising that despite this species' noted tendency for vagrancy, e.g., nine records for the Seychelles (SBRC 2015), Hawaiian Islands, Morocco, and Kazakhstan (Van Giles *et al.* 2014a), it has not been found on the Maldives to date (Anderson 2011, and records therein).

Sharp-tailed Sandpiper *Calidris acuminata*

Five birds have been recorded between 2009 and 2012, all found on Diego Garcia in the northern hemisphere winter. The earliest record was on 08 September 2011 and the latest record on 13 December 2009. A noted vagrant to archipelagos, with a north–south migration broadly from Siberia to Australia (Van Giles *et al.* 2013), this species' [59] appearance in the Chagos fits comfortably with other such migratory shorebirds recorded there.

Collared Pratincole *Glareola pratincola*

There are two records from the Chagos to date, both on Diego Garcia, both associated with Oriental Pratincole *G. maldivarum*. The first bird was found and photographed on 26 December 2009 and remained until 08 March 2010. The second bird was found on 02 October and last seen on 14 November 2012. Presumably, these birds were the nominate race that breeds east to Kazakhstan and Pakistan (Maclean & Kirwan 2013).

Kelp Gull *Larus dominicanus*

As noted by Praveen *et al.* (2014), there is one extraordinary record from Nelson's Island on 07 February 1975 produced by a UK Joint Services Expedition; a description of this bird is contained in the expedition report. It is unlikely that this southern



59. Sharp-tailed Sandpiper

hemisphere species was given passage to the Chagos and it may help to prove Bourne's (1971) prophetic words that migrants and vagrants should be expected in the Chagos from the four points of the compass. There is a second record of a black-backed gull *Larus fuscus*-type that was seen briefly on Diego Garcia on 26 May 2005 (Carr 2005). Due to the lack of detail, this bird was not given specific species status (Carr 2011a).

Arctic Tern *Sterna paradisaea*

The status of this species in the Chagos is now in question. There have been several claims since 1996 (Carr 2011a), though subsequent examination of photographs of some of these birds have shown them to be Common Tern *Sterna hirundo* in non-breeding plumage. It is not out of the question that Arctic Tern are found on passage in the Chagos, especially in the southern waters. However, until evidence that puts the record "beyond reasonable doubt" is produced, this species has been placed on the hypothetical list. There are no records to date of this species from either the Seychelles (SBRC 2015), or the Maldives (Anderson 2011, and records therein).

Black Tern *Chlidonias niger*

Carr (2013, 2014) records the story behind the extraordinary discovery of at least three of "One of the most contentious species recorded in India" (Praveen *et al.* 2014) in a breeding colony of Sooty Tern on South Brother Island on 26 July 2010. Of particular interest is the date of occurrence, and the plumage of these birds. All the birds in the photographs have black breasts and heads, with white lower bellies, and crucially, all white underwings (near full adult breeding plumage) [60]. White-winged Tern *Chlidonias leucopterus*, that are annual migrants in small numbers in the Chagos retain black on their axillaries until at least December, and often until they depart northward in February. There has been another claim by a UK Joint Services Expedition of a single bird in the Egmont Islands on 01 February 1975, but as there is no



60. Three Black Terns in a flock of Sooty Terns.

supporting evidence this record is unconfirmed (Carr 2011a).

White-throated Needletail *Hirundapus caudacutus*

A single record exists of a lone bird photographed on Diego Garcia during 03–08 November 2007 (Carr 2008). It is presumed this bird was the highly migratory nominate, rather than the more sedentary, Himalayan Needletail *H. c. nudipes*. Whilst the photographs were clear enough to identify the species, sub-specific identification is not possible from them.

Common Swift *Apus apus*

This species has been categorised as "...a very rare but seemingly annual overshooting migrant..." in the Chagos (Carr 2011a). Presumably, these birds are of the subspecies *A. a. pekinensis* that have a broadly similar migration pattern from Asia to East- and South Africa (Chantler *et al.* 2015) as Amur Falcon *Falco amurensis*, which is also very rare but an annual visitor in the Chagos.

Species accounts: Introduced species

Cattle Egret *Bubulcus ibis*

Vagrant Cattle Egrets have been recorded on Diego Garcia since the first ornithological records were published, with Bourne (1886) collecting a male of the Asiatic subspecies *B. i. coromandas* [sic] there in 1885. In 1955, 12 birds were introduced from the Seychelles to control pests (Lever 2005) so were presumably of the disputed *B. i. seychellarum* subspecies, or the nominate one, depending upon which taxonomist is followed. Immigration is still occurring, with Carr (2011a, 2015) noting vagrant birds throughout the archipelago between 2008 and 2015. Carr (2015), when reviewing the subspecies of Cattle Egret in the Chagos states that "...with naturally occurring vagrants that most likely arrive from the north (and therefore should be [Eastern Cattle Egret] *coromandus*) and introduced birds from the Seychelles (that are either [Western Cattle Egret] *ibis* or *seychellarum* dependent upon which taxonomist is followed), the question remains as to which "species" breeds on Diego Garcia? Reviewing a limited number of photographs of breeding plumage Cattle Egret taken through 2005–2014 on Diego Garcia, based upon the plate in Hancock & Kushlan (1984, p. 28 - that best depicts the breeding bill colour as well as plumage), both *ibis* and *coromandus* breed in BIOT...". On Diego Garcia these subspecies freely interbreed. There are potential implications for the Indian Bird List, and elsewhere, if these birds are dispersing and the national bird list separates *B. i. coromandus* from the nominate, at the species level.

Madagascar Turtle-dove *Nesoenas picturata*

This species only occurs on Diego Garcia atoll, on the main island plus the nearby East and Middle Islands. It has a total population of 100–200 breeding pairs and is equally seen in and around urban areas as it is in the remaining forested areas (Carr 2011a). The provenance and taxonomic status of this species in the Chagos is presently speculative, at best. To establish its date of arrival Lever (2005) quotes a personal communication of 2004 with Stafford who suggests the species could be native to the Chagos, though Benson (1970) suggests pirates introduced them in the seventeenth or eighteenth centuries as a food source. If the birds in the Chagos are not an endemic subspecies then it

is likely they were introduced from the Seychelles as suggested by Hutson (1975) as most of the other introduced birds were. It is not unreasonable to believe they were originally introduced as a food source, and subsequently, either escaped, or were released. As to the taxonomic status, Bourne (1971) supports the endemic subspecies *N. p. chuni*; more recently, Baptista *et al.* (1997) says the nominate was most likely introduced and is probably now hybridising with introduced *N. p. comorensis*, whilst Benson (1970) advocates that the Chagos birds deserve sub-specific recognition under the name of *N. p. limbata*. Plainly, further research is required and DNA analysis would be of some benefit. Fortunately, this species does not appear to tend towards vagrancy and is unlikely to wander northward to India or to the Maldives from the Chagos.

Zebra Dove *Geopelia striata*

This species was introduced in 1960 to the Chagos by Raymond Mein, a Seychellois worker on Diego Garcia (Lever 2005). It is only found on the main island of Diego Garcia where there is a population of 100–200 breeding pairs. Similar to the turtle-dove above, this species appears very sedentary and has not even colonised islands in the same atoll, so is unlikely to appear on Indian shores from the Chagos.

Madagascar Red Fody *Foudia madagascariensis*

From the founding stock introduced sometime before 1884 (Lever 2005), this species has successfully colonised every island in the archipelago that is capable of sustaining a population, some as small as four hectares (Carr 2011a). It is also regularly seen flying between islands in atolls (Carr, ZSL, *pers. obs.*). With its' successful colonisation of all islands of the Chagos and an obvious apparent readiness to cross open water, it may be a candidate for vagrancy northwards to either the Maldives or to India.

Species accounts: Breeding seabird species

Wedge-tailed Shearwater *Puffinus pacificus*

The commonest shearwater in Chagos waters. It is present all year round, and should be seen on any sea voyage at any time of the year. There are challenges to accurately monitoring burrow-nesting species on islands that are troublesome to swim on to; it is believed there is a stable population of between 1500–3000 pairs breeding annually. The majority of these birds are found on North Brother on the western side of the Great Chagos Bank. The main breeding season is between October and March, though birds nesting in the urbanised part of Diego Garcia have been found with chicks in other months. To date there have only been two sightings of pale phase birds (Carr 2011a).

Tropical Shearwater *Puffinus bailloni*

A common breeding species [61] presenting the same challenges for accurately monitoring as the previous species. It is thought the breeding population is stable and in the region of 750–1500 pairs and these are centred upon North Brother- and South Brother Islands. The breeding season commences in October and has generally completed by mid-April. The taxonomy of this recently split group remains unresolved; the form breeding in the Chagos being assigned to *P. b. nicolae*. Further research may be required to confirm this.

Photo: Peter Carr



61. Tropical Shearwater

Red-tailed Tropicbird *Phaethon rubricauda*

An uncommon breeding species in the Chagos, only known to breed on Diego Garcia; seldom recorded on any other atoll. The maximum count to date is of 16 breeding pairs in 2002 (Guzman 2003). It breeds on the ground, either in isolation or semi-colonially, and does not have a set breeding period in the Chagos. The subspecies breeding in the Chagos has not been ascertained to date. Despite this species being regarded as the most pelagic of the tropicbirds (Orta *et al.* 2014), due to its minuscule numbers in the Chagos, it is unlikely to be a vagrant to India from the Chagos.

White-tailed Tropicbird *Phaethon lepturus*

Less than 50 pairs breed throughout the Chagos on islands where sufficient forest with mature trees with nesting cavities remain, and provide breeding sites. Of interest, there have been sightings of 'golden-washed' tropicbirds in the Chagos (Carr 2011a), including nest-prospecting birds. These were claimed as the Christmas Island endemic subspecies *P. l. fulvus*, though the Europa Island (South Mozambique Channel) endemic *P. l. europae* was not considered at the time of identification. Whichever subspecies these are sightings of, they will have covered a distance capable of putting them in Indian waters.

Red-footed Booby *Sula sula*

This is the most abundant large seabird in the Chagos with some 12000 pairs breeding annually. The subspecies present is *S. s. rubripes* and the entire population is made up of the white morph (with the exception of a single breeding pair of white-tailed brown morph birds). This species breeds throughout the year with a noticeable spike in breeding numbers in March/April. The population is expanding its breeding range and increasing in numbers (Carr 2011a), contra to populations in the western Indian Ocean (Feare 1978). For example, in April 2015 four new islands had been (re?)-colonised in western Peros Banhos, these being the latest in a series of breeding range expansions noted since the first comprehensive seabird census in 1996 (Symens 1999). To date, no research has been conducted in the Chagos to ascertain where this species spends the non-breeding period. It is quite possible it remains in the vicinity of the breeding islands. However, *S. s. rubripes* is the longest winged, and lightest, of the subspecies and is easily capable of

reaching Indian waters.

Brown Booby *Sula leucogaster*

Found throughout the Chagos, similar to the previous species, Brown Booby has been increasing in breeding numbers and expanding its breeding range and there are now in the region of 750–1000 pairs breeding annually. Since the first seabird survey in 1996 (Symens 1999) it has (re?)-colonised the Salomon's Islands atoll and Ile Longue in Peros Banhos and has increased by c. 100% since 1996. The subspecies present is *S. l. plotus*. Again similar to Red-footed Booby, it has a protracted breeding season with spikes of breeding activities. How and where it feeds and where it roosts in the non-breeding period is not known though it is believed that adults remains in the vicinity of breeding islands and juveniles and immatures move further afield (Carboneras *et al.* 2014) It is more than capable of the transit required to Indian waters from the Chagos.

Roseate Tern *Sterna dougallii*

A minuscule breeding population (02–20 pairs) exists in the Chagos; the normal breeding period appears to be October–April. The subspecies present has not been determined to date. It is an unlikely candidate for vagrancy north to India from the Chagos.

Black-naped Tern *Sterna sumatrana*

This species is a found in the lagoons of all of the atolls of the Chagos and all four atolls hold small nomadic breeding populations. There are 20–100 breeding pairs in the archipelago and the normal breeding period is October–April, though breeding has been recorded outside this period. It is another unlikely candidate as a vagrant from the Chagos to India.

Lesser Noddy *Anous tenuirostris*

A species with a very complicated breeding strategy in the Chagos. It breeds throughout the Chagos with three epicentres holding the bulk of the population that nest at differing times. Approximately 40000 pairs of the nominate subspecies nest annually. When feeding and foraging in the Chagos it is very much an inner lagoon species and is seldom seen more than a kilometre from land. Where it spends the non-breeding period is unknown. It is more than capable of reaching Indian waters.

White Tern *Gygis alba*

A common species throughout the Chagos though not particularly numerous. There are perhaps 250–650 breeding pairs nesting on most islands in all atolls. It does not form single species flocks though is often seen far out at sea at prey balls with mixed species flocks, especially Red-footed Booby and Common Noddy *Anous stolidus*. Due to its pelagic feeding habits, it could be a potential vagrant north from the Chagos.

Discussion

It is unlikely that there are any new breeding species left to discover, though new colonists are always a possibility. Yellow Bittern *Ixobrychus sinensis*, Indian Pond-heron *Ardeola grayii* and Little Egret *Egretta garzetta* are probably the strongest candidates. Further detailed research in to the taxonomic status

of the Madagascar Turtle-dove could lead to a new subspecies. It is believed that the 18 breeding species of seabirds reflects what currently breeds in the Chagos. An examination of the taxonomic status of Tropical Shearwater may lead to at least an endemic subspecies and the golden-washed White-tailed Tropicbird, if found breeding, would prove exceedingly interesting and either a range extension or, less likely, a new subspecies.

Being the final termini for north / south migrants, the Chagos is highly unlikely to provide potential landbird vagrants or colonists north. Perhaps it is better used as an indicator of what species may occur as vagrants to the north from the east and to a lesser extent from the west. Diego Garcia with its freshwater wetlands is a magnet to overshooting vagrants or those pushed of course from western and eastern migration flyways. Due to the island's small size and concentrated birding spots, when birders are present on Diego Garcia, particularly through September to December, finding vagrants is nowhere as difficult as locating them on the mainland. The discovery of over 25 species new to the Territory between 2007 and 2013 may be testimony to this. The only land bird thought of, as a possible vagrant/colonist north, is Madagascar Red Fody, based upon the fact it has colonised every island in the Chagos, mainly unassisted.

It is the seabirds of the Chagos that may provide interesting records to the north. Pelagic foragers and feeders such as Red-footed Booby, Wedge-tailed, and Tropical Shearwater, and White Tern are probably the strongest candidates. It is presumed that if they were to appear as vagrants north, it is more likely to occur during the south-eastern trades after the peak breeding period, and involve inexperienced juvenile birds.

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Appendix

Table 1: A checklist of the birds of the British Indian Ocean Territory

[Reproduced with permission from the author from Birds of the British Indian Ocean Territory (Carr 2011a) and updated to July 2015.]

Legend

? = Status or date of occurrence uncertain; ○ = Occurs very exceptionally (< 10 birds ever) or involves long-staying individual birds; ● = Occurs annually in very low numbers (generally < ten birds/year); ◼ = Occurs annually or resident (generally <100 birds); ◼◼ = Occurs annually or resident (generally >100 birds).

¹. Recorded from Diego Garcia only; ². Recorded only at sea; ³. Recorded from northern atolls only; ⁴. Recorded in all appropriate habitat throughout the Territory.

IBR = Introduced breeding resident, BR = Breeding resident, NBR = Non-breeding resident, NWV = Northern winter visitor, SWV = Southern winter visitor, PM = Passage migrant, V = Vagrant, ? = Status uncertain

Species	Status	J	F	M	A	M	J	J	A	S	O	N	D
White-cheeked Tern <i>Sterna repressa</i> ¹	V	○	○	○	○	○					○	○	○
Bridled Tern <i>Sterna anaethetus</i> ⁴	BR	◼	◼	◼	◼	◼	◼	◼	◼	◼	◼	◼	◼
Sooty Tern <i>Sterna fuscata</i> ⁴	BR	◼	◼	◼	◼	◼	◼	◼	◼	◼	◼	◼	◼
White-winged Tern <i>Chlidonias leucopterus</i> ¹	V	○	○	○	○	○					○	○	○
Black Tern <i>Chlidonias niger</i> ³	V								○				
Brown Noddy <i>Anous stolidus</i> ⁴	BR	◼	◼	◼	◼	◼	◼	◼	◼	◼	◼	◼	◼
Lesser Noddy <i>Anous tenuirostris</i> ⁴	BR	◼	◼	◼	◼	◼	◼	◼	◼	◼	◼	◼	◼
White Tern <i>Gygis alba</i> ⁴	BR	◼	◼	◼	◼	◼	◼	◼	◼	◼	◼	◼	◼
Pomarine Jaeger <i>Stercorarius pomarinus</i> ³	V										○		
Parasitic Jaeger <i>Stercorarius parasiticus</i> ¹	V											○	
Rock Pigeon (Feral Pigeon) <i>Columba livia</i> ¹	V									○	○		
Madagascar Turtle-dove <i>Nesoenas picturata</i> ¹	IBR	◼	◼	◼	◼	◼	◼	◼	◼	◼	◼	◼	◼
Zebra Dove <i>Geopelia striata</i> ¹	IBR	◼	◼	◼	◼	◼	◼	◼	◼	◼	◼	◼	◼
White-throated Needletail <i>Hirundapus caudacutus</i> ¹	V											○	
Common Swift <i>Apus apus</i> ⁴	V										○	○	
Fork-tailed Swift <i>Apus pacificus</i> ¹	V					○						○	
European Roller <i>Coracias garrulus</i> ¹	V											○	
Blue-cheeked Bee-eater <i>Merops persicus</i> ⁴	V	○			○								
Eurasian Hoopoe <i>Upupa epops</i> ¹	V			○									
House Crow <i>Corvus splendens</i> ¹	NBR	○	○	○	○	○	○	○	○	○	○	○	○
Sand Martin <i>Riparia riparia</i> ¹	V										○		
Barn Swallow <i>Hirundo rustica</i> ¹	V	○	○								○	○	
Common Myna <i>Acridotheres tristis</i> ¹	IBR	◼	◼	◼	◼	◼	◼	◼	◼	◼	◼	◼	◼
Rosy Starling <i>Sturnus roseus</i> ¹	V											○	○
House Sparrow <i>Passer domesticus</i> ³	?	?	?	?	?	?	?	?	?	?	?	?	?
Madagascar Red Fody <i>Foudia madagascariensis</i> ⁴	IBR	◼	◼	◼	◼	◼	◼	◼	◼	◼	◼	◼	◼
Yellow Wagtail <i>Motacilla flava</i> ¹	V						○				○	○	
Grey Wagtail <i>Motacilla cinerea</i> ¹	V				○	○							

Table 2: A checklist of the birds that have historic records but are not accepted as having occurred "beyond reasonable doubt" or, did occur but have died out from the British Indian Ocean Territory. A brief discussion of these records follows the table.

Species	Comment
Guineafowl species Numididae	A failed introduction
Grey Francolin <i>Francolinus pondicerianus</i>	A failed introduction
Common Teal <i>Anas crecca</i>	Erroneously named in original paper - should be "Garganey Teal"
Giant Petrel species <i>Macronectes</i>	Specimen not identifiable to species level
Persian Shearwater <i>Puffinus persicus</i>	Record under consideration
Southern Fulmar <i>Fulmarus glacialis</i>	Insufficient evidence to support record
Broad-billed Prion <i>Pachyptila vittata</i>	Insufficient evidence to support record
Gadfly petrels <i>Pterodroma</i> species	Identification not made to species level
White-bellied Storm-petrel <i>Fregatta grallaria</i>	Insufficient evidence to support records
Western Reef-egret <i>Egretta gularis</i>	Insufficient evidence to support record - record withdrawn
Christmas Frigatebird <i>Fregata andrewsi</i>	Records under consideration
Abbott's Booby <i>Papasula abbotti</i>	Insufficient evidence to support records
Pelican species <i>Pelecanidae</i>	Identification not made to species level
Sparrowhawk species <i>Accipitridae</i>	Identification not made to species level
Great Snipe <i>Gallinago media</i>	Author acknowledged identification uncertain
Asian Dowitcher <i>Limnodromus semipalmatus</i>	Insufficient evidence to support record
Nordmann's Greenshank <i>Tringa guttifer</i>	Insufficient evidence to support record
Wandering Tattler <i>Heteroscelus incanus</i>	Insufficient evidence to support record
Lesser Black-backed Gull <i>Larus fuscus</i> species	Identification not made to species level due to taxonomic problems
Arctic Tern <i>Sterna paradisaea</i>	Several claims but insufficient evidence and some birds proven to be misidentified by photographs
Whiskered Tern <i>Chlidonias hybrida</i>	Insufficient evidence to support record
Great Skua <i>Catharacta skua</i>	Insufficient evidence to support record
Long-billed Corella <i>Coccyzus tenuirostris</i>	Unconfirmed failed introduction
Pigeon species <i>Columbidae</i>	Identification not made to species level
Little Swift <i>Apus affinis</i>	Insufficient evidence to support record
Pied Crow <i>Corvus albus</i>	Insufficient evidence to support record
Northern House-martin <i>Delichon urbicum</i>	Insufficient evidence to support record
Bulbul species <i>Pycnonotidae</i>	Insufficient evidence to support record
Golden-crested Myna <i>Ampeliceps coronatus</i>	Record withdrawn

Notes on a checklist: Birds that have historic records of, but are not accepted as, having occurred “beyond reasonable doubt” or did occur but have died out in BIOT

Guineafowl species Numididae

A guineafowl, likely to have been Helmeted Guineafowl *Numida meleagris* was found in the Salomon Islands in 1905 by the Percy Sladen Expedition: it has never been reported since.

Grey Francolin *Francolinus pondicerianus*

This species was recorded on Diego Garcia in 1960 and was possibly still there in 1964. The possible 1964 record was the last potential sighting and it has certainly died out in BIOT.

Common Teal *Anas crecca*

There is a record of three female and a drake “Garganey Teal (*Anas crecca*)” in March 1995. It is certain that these records refer to Garganey *Anas querquedula* and not *Anas crecca*.

Giant Petrel *Macronectes* species

A record exists of a Giant Petrel species being bought on Diego Garcia in July 1970. The specimen is now in the Ministry of Agriculture in the Seychelles and has not been identified to species level to date.

Persian Shearwater *Puffinus persicus*

See main text. [62]

Southern Fulmar *Fulmarus glacialoides*

A single record exists of this species being provisionally identified at sea in July 1958 at 10°S 69°E.

Broad-billed Prion *Pachyptila vittata*

There are records from pre-1971 and a recent claim of five Broad-billed Prions at sea at 7:0:0S, 78:12:0E on 19 Feb 2001. These



Photo: Peter Carr

62. Persian Shearwater

records have been treated with caution due to the absence of substantiating evidence and the difficulty of identifying this genus at sea and also the potential vagrancy of several prion species in the Indian Ocean.

Gadfly petrels *Pterodroma* species

There are numerous possible sightings of this genus from BIOT waters, though with the exception of the Tahiti Petrel referred to in the main text, no other conclusive report has been published to date.

White-bellied Storm-petrel *Fregetta grallaria*

There are details of possible sightings of this species in BIOT waters, though no conclusive report has been published to date.

Western Reef-egret *Egretta gularis*

A claim exists of a sighting on Diego Garcia in March 1996 that was attributed to either this species or dark phase Little Egret *Egretta garzetta*. This record has been withdrawn.

Pelican species Pelecanidae

Information of a pelican in Peros Banhos lagoon in January 2009 were passed to the author by two yachts that were there at the time, there is insufficient detail to claim a positive record to species level.

Abbott's Booby *Papasula abbotti*

There have been at least two claims of this Christmas Island breeding endemic in the Chagos, sadly neither record has any supporting documentation or photographs. As such, it remains in the hypothetical list.

Christmas Frigatebird *Fregata andrewsi*

See main text.

Sparrowhawk species Accipitridae

A “sparrowhawk” was seen hunting through the Downtown area of Diego Garcia on 26 December 2008; it was not identified beyond genus.

Great Snipe *Gallinago media*

A record exists of “Eight snipe, almost certainly this species...” on Diego Garcia on 03 April 1971. As no supporting information exists and the author of the record admits uncertainty, this record has been placed in the non-verified category.

Asian Dowitcher *Limnodromus semipalmatus*

There is a single claim for this species in that of a lone bird on Diego Garcia on 17 March 1995. There is not enough supporting evidence to place this IUCN categorised “Near Threatened” species (with a decreasing world population of 23,000 birds) in the confirmed category.

Nordmann's Greenshank *Tringa guttifer*

There is a claim of this species on Diego Garcia on 21 March 1995. There is not enough supporting evidence to warrant

placing this IUCN categorised “globally endangered” species (with an estimated world population of 500 - 1,000 birds) in the confirmed sightings category.

Wandering Tattler *Heteroscelus incanus*

This species appears as a captioned illustration in David Bellamy's book “Half of Paradise,” which covered the Joint Service Expeditions to BIOT in the early 1970's. It is also mentioned in an unpublished ornithological report of the 1972 / 73 Joint Service Expedition to the Egmont Islands, presumably the source of the “Half of Paradise” illustration. There is insufficient evidence in either of the records mentioned to differentiate this species when in non-breeding plumage from the virtually identical Grey-tailed Tattler *Heteroscelus brevipes*. Therefore, the records are placed in the non-verified category.

Lesser Black-backed Gull species *Larus fuscus*

Lesser Black-backed Gull taxonomy is in a state of flux and the level of detail in the record of a single adult that over flew the accommodation area of Diego Garcia on 26 May 2005 is not sufficient to confirm identification to species level, other than saying it was a *Larus fuscus*-type.

Arctic Tern *Sterna paradisaea*

There have been several claims by Carr and RNBWS expeditions (Carr 2011a) dating back to at least 1996. Following a review of some of the available photographs pertaining to these records, which were sub sequentially identified as Common Tern, all records of Arctic Tern are under review.

Whiskered Tern *Chlidonias hybrida*

A single adult in non-breeding plumage was claimed to be seen on Diego Garcia on 21 March 1995. Non-breeding and immature plumaged *Chlidonias* terns are not so straight forward to identify. It has been proven that the marsh tern that regularly winters in BIOT is White-winged Tern *Chlidonias leucopterus*. As there is no supporting photograph or description to substantiate the record, it is possible that the record refers to White-winged Tern and this record is therefore placed in the non-verified category.

Great Skua *Catharacta skua*

Records exist of three sightings of possible Great Skuas at sea up until 1971. As there is no supporting information or photographs and the possibility of confusion with other skuas, which occur in

the area, these records are treated with caution and placed in the non-verified category.

Long-billed Corella *Cacatua tenuirostris*

Unconfirmed reports (Wikipedia) state that this species was unsuccessfully introduced to the Chagos Archipelago. Further details are lacking.

Pigeon species Columbidae

There are unconfirmed reports in the Nineteenth Century of pigeons occurring in BIOT. Some credence is lent to these reports with the occurrence of a Rock Pigeon (Feral Pigeon) in 2009.

Little Swift *Apus affinis*

An illustration captioned “Little Swift” appears in Davis Bellamy's book “Half of Paradise”, which detailed the activities of the Joint Services Expeditions to BIOT in the 1970's. As there are no supporting details for this bird and, because of the possible confusion with other white-rumped swifts that can occur in BIOT, this record is placed in the not conclusive category.

Pied Crow *Corvus albus*

There is a single claim of this species: a lone bird on Ile du Coin, Peros Banhos on 08 October 1974. There is no supporting information and every possibility that House Crow was involved. Therefore, this record has been placed in the non-verified category.

Northern House-martin *Delichon urbicum*

Two hirundine species were seen by the Percy Sladen Trust Expedition of 1905. Further details are lacking.

Bulbul species Pycnonotidae

Records exist that a bulbul species was introduced to Diego Garcia that, “...became common by about 1953, but at this time it suddenly died out and was not reintroduced” It has been speculated that this species was Olivaceous Bulbul *Hypsipetes borbonicus*. If the species was ever introduced, it certainly no longer occurs in BIOT.

Golden-crested Myna *Ampeliceps coronatus*

This species was claimed to be seen on Diego Garcia in 1996. This record is incorrect and has been withdrawn.



Birds in urban human habitations and the case in Dharwad, northern Karnataka

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Abstract

An overview is presented of bird species, both known residents of cities and towns in southern India, and recent immigrants (as well as migratory passage migrants) which have been pressured to adapt to such recent expanding urban habitats for food availability and even breeding sites. Also of those species which have fled the human and domestic animal population 'bomb' in such habitations, when living became dangerous or unsuitable for privacy, food and nesting. M.D. Lister's (1952, 1953) seminal works on some bird associations of Indian built-up areas, and of Indian cultivated and waste lands, are suggested as markers: models of existing situations from then and now, for comparison. Murton's (1971) work is recommended for overall thematic and scientific considerations. He had emphasised that man is the agent initiating changes, that this was evolution in progress and that we are witnessing natural selection at work; it is the duty of the conservationist to understand such change, and certainly not deplore change out of hand. He had hoped that we learn to treat birds as an important component of our environment, even if being a small percentage of human numbers in cities compared to at least twice human numbers in the country, farmland and jungle. Urban population in India stands at 54% in 2014 (http://www.who.int/gho/urban_health/situation_trends/urban_population_growth_text/en/), and by 2060 it is generally predicted that a majority of humans would be living in built-up urban areas.

My experience in Dharwad during the last ten years is elaborated, and a list presented of urban avifauna noticed in this small, university-, foothill-town, which could be compared to those observed by Lister (1952, 1953) in Delhi. These Dharwad birds include several surprising species apparently adapted here even to house compounds, which would not even be looked for in the currently ungainly metropolis Bengaluru where I had lived for the first 60 years of my life, 40 of them engaged in bird-watching on our family farm, the agricultural university campus and city transit halts and visits, in between. A total of 208 species have been recorded from Dharwad city and district, both in literature published from 1968 to 2010 (though 24 of them are gross misidentifications and are noted as such; see Appendix 2), and my own observations from 2006. Around 185 of them can be termed city (urban) and suburb adapted species here, with identities confirmed, and are discussed briefly.

Introduction: Urban avifauna

I quote Murton (1971) below, and use Lister's (1952, 1953) works as examples of analyses and provide my lists from Dharwad (earlier Dharwar) city and surrounds as comparison.

Murton (1971: xix) had written "...the fundamental issue in conservation [emphasis mine—K.G.] is whether man should maximise his own numbers at the expense of wild-life, as he could easily do, or whether he should regulate his numbers at a level which will allow him to enjoy something of his natural heritage." I myself strongly feel that human populations are a great and perhaps irreversible threat to other wildlife on earth, and to a sustainable human *lifestyle*, not 'development' only. But, curiously, current thought, influenced primarily by commerce, feels otherwise and encourages population growth!

In the Indian context, it will be helpful to quote some select passages from Lister (1953: 369–370):

"The larger and faster a town grows the greater is its impact upon the avifauna of the land swallowed up by it, and the more effectively is the character of the surrounding country submerged, so that eventually many of the birds which used to inhabit the place when the settlement was only small are driven out—though they are rarely expelled entirely—and a less varied avifauna, better adapted for survival in the modified conditions, takes its place. Even when the climax avifauna of a large town has been reached

it does not necessarily remain static. A town, after all, is a living organism. The town council may in its wisdom decide to make public gardens when the rows of houses occupying a certain site fall or are pulled down; or an acre of two of undeveloped waste land may be allocated for the erection of a factory. Basically, no doubt, the climax urban avifauna undergoes little alteration, though within its limits local changes do take place."

About cultivated and waste land in and around our habitations, Lister (1952: 19) had written:

"I am dealing with cultivated and waste land together, as in many cases there is not such a very great deal of difference between them from the point of view of a bird, and very often the two are so interwoven as to be ecologically almost inseparable. Both are open, with occasional trees and bushes. The waste land is usually covered with grass and often weeds, even though the growth be only meagre, while the cultivated land is either covered with crops, many of which are low-growing and provide considerable areas of uniform cover, or else are lying fallow or newly-ploughed. There are usually more bushes and other similar cover on the waste land, and the vegetation is often much more uneven than in the acres of similar crops."

In British (undivided) India, the ten largest cities were Ahmedabad, Amritsar, Bombay (Mumbai now), Calcutta (Kolkata), Cawnpore (Kanpur), Delhi, Hyderabad, Lahore, Lucknow, and Madras (Chennai). Today these and many others are as big or much bigger. The Indian human population in 1941 was 318,660,580 and only 14% of its people then lived in cities. In this century the population has risen more than three-fold to 1,228,737,436 and rising, and twice the number (28%) now reside in urban areas (*vide* Oxford School Atlas, 2011, OUP, New Delhi). In 2014 urban population was 54% (http://www.who.int/gho/urban_health/situation_trends/urban_population_growth_text/en/), and by 2060 it is generally predicted that a majority of humans would be living in built-up urban areas. However, India is a huge country and it is still a relief to find almost three-fourth of its human population village- and countryside-based, for their occupations.

Forest areas have been drastically reduced. When the British left in 1947, almost 50% was still under jungle and now hardly 3% remains after six decades of Indian administration! Devastation of the Indian natural biodiversity has been tremendous. My 'Guru,' the late M. Krishnan (1989), had summed up his life's wisdom (as a naturalist) thus,

"The only natural heritage that we have (though we have the vandalistic power to destroy or mutilate it), is the wholly natural physical character and entity of the land, its native flora, fauna and geomorphology. It is only this that has an authentic and truly Indian quiddity, only this that can provide a stable basis for the continuity of the entity of India...We should safeguard this natural identity of our country at least in representative, revivable or still unspoilt bits of it, for future generations to have any sense of national identity or continuity with the past—at least in, say, 10% of the total land area. If

we cannot meet the needs of our peoples with 90% of the land, then there is something seriously wrong with our administrative efficiency."

Today the situation is depressing and 'depauperate' (as late Zafar Futehally had written me on 25 June 2013, as a new word describing, himself!). Even the House Sparrow has left for richer and quieter grounds in still calm villages, far away from modern, noisy 'civilization.' Only Black Kites circle slaughterhouses, garbage dumps for carrion and other eateries, rock pigeons nest in high-rise buildings and in sports stadia, and there is a cacophony of House and Large-billed (yes, these too) Crows searching for eats in garbage dumps all over the city, along with packs of pariah dogs, or pigs as here in Dharwad. The Common Myna hobbles with its Jungle cousin. Yes, this too which has invaded food (garbage)-rich cities. In small town Dharwad I found Yellow-billed Babblers common in house compounds waiting for home refuse to be thrown out before domestic help arrived to wash and clean vessels. The bird guides I use, when and if required, to confirm species identifications are Grimmett *et al.* (1999), Kazmierczak (2000), and Rasmussen & Anderton (2005).

Dharwad and surrounding country flora, fauna

This paper is another effort towards a future updated documentation of the Ornithology of what was known as the "Bombay Deccan and southern Mahratta Country" (Butler 1881; and map). The references listed at the end of this paper include most of the major works available on birds, *etc.*, of this area, but some have not been cited in the text deliberately. Sykes (1832a–b), Jerdon (1839a–b, 1840a–d, 1841, 1843, 1844, 1845, 1846, 1862, 1863, 1864), and Blyth (1845a–c, 1847, 1852, 1866a–b, 1867a–b) were the pioneering ornithologists who wrote on the birds of this area and discoveries of its bird life, publishing between 1832 and 1867 or so. Davidson & Wenden (1878) worked the Poona–Sholapur–Gulbarga–



Photo: Indrajit Chorpede

Raichur transect (Bhima Valley) after the Reverend Fairbank (1876) had published on the birds of the ghats, from Khandala south to Belgaum. Ghorpadé & Lokesha (2011) updated the Raichur District and Bhima River valley ornithology recently. Vidal (1880) had written on birds of the south Konkan, and Captain Butler (1881) had compiled all information then available on the ornithology of the Bombay Deccan and South Mahratta Country, which is very helpful as a major base (429 confirmed species included, inclusive of those of the ghats). Macgregor (1887) added to Butler's list. Davidson (1898a, b) wrote a detailed paper on North Kanara ornithology. But after them there have hardly been any significant publications, except for Koelz (1942) on the Londa neighbourhood birds (I have Abdulali's annotations on this paper hardcopy, from T.R. Bell's collection, which he presented to me), Neginhal (1971) on avifauna in the vicinity of the Tungabhadra River, and Uttangi (2003) on the Anshi National Park area. I have searched Abdulali's (1968, 1969, 1970, 1972, 1983, 1988) catalogue for species taken in this present area of focus. My Sandur taluka ornithology (Ghorpade 1974) is another detailed local area study.

Dharwad town and district (15.417°N, 75.35°E; 727 m alt.), straddles an area of 200 km² and has 45 villages in five talukas. Human population is just over 1.6 million, 1.2 million of them in the Hubli–Dharwad twin city area. Rainfall is about 90 cm per annum, most falling in July and ranging from June

end to early September, with 27°C–36°C average temperature. West of the city is an undulating foothill of Western Ghats tract (400–800 m) with red to greyish-brown soil, and to the east the Deccan plain with red loams to black cotton soil. Flora is disturbed deciduous forest, reduced to low scrub, interspersed with cultivation. The tropical dry deciduous forest begins some 20km west of Dharwad. See Ghorpadé *et al.* (2013) for more details of the Dharwad area.

Each large city in India has its 'backyard biodiversity' bank, e.g., the Ridge forest in Delhi, Borivli jungle in Mumbai, Bannerghatta NP in Bengaluru, Malliabad and the two rivers in Raichur, and so on. All relatively undisturbed habitats with some useful biota for our use or maintenance of healthy ecosystem back-ups near human habitations are the urban area's 'Backyard Bank.' The biota of these backyard banks needs also to be well surveyed, sampled and documented for use by humans in future, for better-managed developmental plans for a more *sustainable lifestyle*. The Western Ghats foothills, a few kilometres to the west of Dharwad, from a little north of Mugad south to Kalghatgi, is this city's backyard biodiversity and needs study of its bird species diversity, and their populations, through each year, as a back-up data bank.

About Dharwad, Chakravarthy (1993) had suggested, "It seems to me that if Town Planners make use of the edge effect in an appropriate manner, they will succeed in attracting a large



Photo: Indrajit Ghorpade

64. Great Indian Bustard *Ardeotis nigriceps*

number of birds of different species. I would suggest that other birdwatchers when they visit Dharwad, pay special attention to the abundance of bird species where there is a mix of different habitats."

James Channabasappa Uttangi (1997), the ninety-plus year old senior most pioneer bird man of Dharwad (who passed away in 2014), had written, "Essentially, the vegetation of this forest edge community of Dharwad consists of grass, shrubs and scattered trees with open ground and meadows. Birds adapted to live in ecotones or forest-edge community show a close relationship with the arrangement of standing crops."

This city of Dharwad, earlier spelt 'Dharwar,' and c. 1000 years old—the British had annexed it in 1818 (Ladawa *undated*), has had very few resident naturalists or bird-watchers, and documentation of its avifauna is poor, careless, amateurish and presumptuous (in my studied opinion), notwithstanding academics and professors like Drs Uttangi and Desai being the main bird men and contributors here. Butler (1881: 367) had given "Kolapur, Dharwar, Kaladgi" of the "*Southern Deccan*" as being "Ornithologically unexplored" in his tentative catalogue of the birds of the Deccan and South Mahratta Country. The bird lists of Uttangi (1985) and Desai *et al.* (1999, 2000) are the only fairly detailed attempts, but suffer from many errors. I attempt to analyse these, update status of the urban avifauna

now predominant here, and add my own first-hand observations of birds made in Dharwad, from late 2006 onwards (see Appendix 2).

Birds in house compounds, waste lands, parks and campuses in Dharwad

A thorough search of Indian bird literature resulted in the 50 or so papers and notes appended in the References below. Uttangi (1985), and Desai *et al.* (1999, 2000) attempted to compile a list of species seen in and around Dharwad and the latter stated that, "In the present study as well as [that] by Uttangi (1985) 129 species of birds belonging to 44 different families have been recorded." A careful study has revealed these lists to be inclusive of misidentified and unlikely species (see Appendix 2). Many species are doubtful and require to be confirmed by new, properly identified records, or then rejected as errors, as done here (Appendix 2). Others that are very evident and common in Dharwad have been curiously omitted (!), like the Black Kite and the Shikra, as well as others pointed out below and in Appendix 2. My compilation and analysis of the data available prompts me to suggest a total of 208 species so far authentically recorded (or doubtful) in Dharwad city and district, either in earlier publications or from my own first-hand observations. A



Photo: Indrajit Chorpede

65. Common Hawk-Cuckoo *Hierococcyx varius*

more detailed “Annotated List” will be published separately (Ghorpadé, *in prep.*), and just a simple list of species (185) found in Dharwad city is given in this article (Appendix 2). Below I attempt to just update Uttangi’s (1985) comprehensive paper on Dharwad–Hubli birds and so pre-empt a more detailed text, this to be published later, after more serious and focused bird-watching here in many other habitats and locations.

Uttangi’s (1985) introduction and notes on Dharwad topography, climate and plant species is useful background reading. I will comment on birds he had listed under six subheadings (habitats) in that paper, and update the reader with the current scene in Dharwad. This small town still has the ‘old fashioned’ houses and bungalows with adequate walled compounds and plenty of plants, mainly useable coconut and other fruit trees, like mango, sapota, and guava. Home gardens are rare as in most parts of independent India, generally. Apartment blocks are few and rare, but now getting increasingly apparent with builders choosing construction of such clustered living spaces to provide housing for a growing ‘modern’ population. Like Uttangi wrote, both crow

species, two mynas and occasional sparrows are usually seen in such house compounds. However, I have found the Yellow-billed Babbler very frequently around houses and in layouts, searching kitchen waste for suitable food, in noisy groups. No bird-watcher had mentioned this bird here earlier. Perhaps the most successful of urban adapted birds is the Red-vented Bulbul, among the first to wake you up with early morning calls around 6am. The Greater Coucal, Koel and White-throated Kingfisher are also early risers, and the small bird with a loud voice, our Tailorbird, is also active in the early mornings. Black Kites soar in air above, looking for food, and the ‘clapping’ of wings of the Rock Pigeons is a familiar sound, and then sight, also. Like the Red-vented Bulbul, the Ashy Prinia is another abundant city bird, even more visible than the Tailorbird. Dharwad also has good populations of Red-whiskered Bulbuls, which is interesting. Occasional sightings of White-browed Bulbuls happen, and their loud calls are also heard. Uttangi had mentioned in one of his papers that the elimination of *Lantana* bushes in Dharwad was a factor in this bulbul’s reduced presence, but we now have plenty of lantana bushes



Photo: Indrajit Ghorpadé

66. Lesser Golden-backed Woodpecker *Dinopium benghalense*

with their all-year flowering, so critical for nectar feeding birds and insects, especially butterflies. Elsewhere, I (Ghorpadé 1997) had written in some detail about the usefulness or otherwise of this introduced exotic plant in India. Ioras, with their beautifully melodious voices, are a pleasure when seen and heard as they search large trees for food. The Magpie-Robin is also common in built-up colonies and is another melodious singer. The Red-wattled Lapwing is also often heard and seen.

The bird community in houses and built-up colonies vascillates over the seasons. The Pied Bushchat is such a notable local migrant in its preferred season, post-monsoon. Obviously in the post-monsoon colder months we have many local or distant migrant birds like swallows, orioles, hoopoe, flycatchers, warblers, iora, white-eye, minivets, hornbills, shrikes, etc., swelling the city's bird life. A pair of White-throated Fantails frequents my bungalow compound. They are tame and confiding, and again have not been mentioned by earlier bird-watchers. Other flycatchers seen are the beautiful male Paradise, frequently, as well as the Brown and Red-breasted, these in winter months. The bulbuls are also familiar 'neighbours' and Greater Coucals too. A few more years of records of bird species seen in each month will provide a more accurate log of the presence of breeding residents and local migrants. In open wastelands used as grazing ground by cattle, goats and sheep, the Cattle Egret is yet another dominantly adapted urban bird, like Pond Herons. Grazing cattle have Black Drongos, Common- and Jungle Mynas, crows, Scaly-breasted Munias, and Greater Coucal joining them for disturbed insects taken by these birds as food. The House Swift has a common presence in the air and is joined in winter by Barn, Red-rumped, and Wire-tailed Swallows, which latter use power lines for resting. I have noticed very few White-browed Wagtails in Dharwad, though they are abundant in Bengaluru. Grey Wagtails are frequent in Dharwad in

winter along with Yellow- and White Wagtails which hunt insects on the many open lawns and in crop field stubble in our UASD campus. But the Rufous Treepie's raucous, rasping call is rarely heard here. The Indian Roller is also not that common on electric lines but more evident in open country. There is heightened presence of the Jungle Myna here, and the Brahminy Starling often joins them. The crowds of Rosy Starlings are frequent in their season and I have rare sightings of the Bank Myna also here (Taheer *et al.* 2010). Cinereous Tits are also fairly frequent, but Uttangi's (1996a) surprising records of the White-naped Tit and White-eared Bulbul need to be confirmed (see Appendix 2). Hanging Parakeets are very common during parts of the year, looking for food on flowering trees in noisy flocks. The Indian Robin, a 'double endemic,' both genus and species (Rasmussen 2013), is the Deccan endemic and I have found it in more open and stony areas in our agricultural college campus, and also saw one pair in a vacant city colony plot on a single occasion. Blyth's Starling is rarely seen. Pavan also has a record from the same campus. The Purple-rumped Sunbird is another successful urban adapter, singing and chirping away while taking nectar from all kinds of flowers of herbs (like *Stachytarpheta*, *Indigofera*, and *Sida*), shrubs (*Lantana*, which is found in town, *Crotalaria*, and *Gliricidia*) and high up in flowering trees as well (see Appendix 1 for a list of predominant Dharwad flora and other larger fauna). Flowerpeckers are found near mango trees with the arboreal *Viscum* or *Loranthus* plant parasites on them, and also white-eyes in such small birds 'hunting parties.' The Purple Sunbird, like the Indian Robin, is selective; opting for areas that are less crowded with people, and in open land with *Lantana*, and thus is rarer in town. Woodpeckers are pretty rare, so are Coppersmith Barbets, which are less vocally evident here than they are in Bengaluru. Spotted- outnumbers Laughing Doves, and the stately Eurasian



Photo: Indrajit Chopade

67. Blyth's Starling *Sturnia malabarica blythii*.

Collared Dove keeps more to open country in the eastern city suburbs and to our Agricultural University (UASD) campus. I need to do more critical surveys of this campus for other open country birds. My erstwhile postgraduate student Sabbithi Pavan (*in prep.*) has just sent me a list of birds he had observed in the campus and other Dharwad areas and has recorded ten species for the first time here (see Appendix 2).

Fruit-eating birds, like Rose-ringed Parakeets, Asian Koels, and bulbuls are also fairly evident, and the Grey Hornbill is often seen. The Brown Shrike is seen here regularly in winter and both the resident and the migratory Long-tailed Shrike (in winter months) are also frequent. In winter one waits for the first 'chuck-chuck' call of the migratory Blyth's Reed Warbler, which shares its wintering period in southern India with the Brown Shrike. The Great Grey Shrike avoids crowded areas with humans, like the Bay-backed Shrike and most babblers, larks, pipits, and sparrow lark. The Spotted Owlet is most often heard at night; I also heard a Collared Scops Owl once from my 'barsati' room in Narayanpur in June. Raptors are visitors often, and those recorded are listed (Appendix 2). Harriers are rare, seen only in open country, but the Shikra is always evident in town, and was mentioned by Uttangi (as 'Sparrow hawk'). The Baya Weaver nests over old wells and in trees on tank edges, but is not that common.

There are a few tanks in town and many others outside Dharwad. The cited literature below has species sighted at these (see also Appendix 2). Besides the Little Grebe, Common Coot, and egrets, the usual sandpipers, stilts, etc., do occur in winter, but in small numbers, especially on nullahs polluted with municipal sewage, where the kingfishers and larger herons, pipits and wagtails abound, hunting for food. The Brahminy Kite (adults and immatures) breeds here and is sometimes seen soaring over town, with Black Kites. I have not done critical, sustained studies

of waterbodies in and around Dharwad yet.

The Dharwad city 'country market' area, with the main police station and a large park nearby, has thousands of screeching myna species roosting on large trees there each evening; also sparrows. Dharwad is a dominantly 'vegetarian' city and the few slaughter houses and meat markets have their bird communities, mainly Black Kites, crows, mynas, and the odd shrike.

In closing, may I point out that much more substantial, careful work needs to be done of Dharwad—Hubli Ornithology, and of the forest areas to their west (Western Ghats), and the grasslands and open cultivation to their east (Deccan Plateau). What has been done is fairly indicative of Dharwad avifauna, but finding small, special, and undisturbed habitats may turn up more surprises in this peaceful area, with still minimal urban disturbance, vehicular traffic, industrial noise and pollution. Hubli is the second largest 'market,' industrial, town in Karnataka. Its large 100+-year-old Unkal Lake (250+ acres area, planned by the celebrated engineer, late Sir M. Vishwesharayya) is poorly conserved and little planted with suitable aquatic vegetation, for birds and other waterbody wildlife. Birds on the larger farms around Dharwad would also help log interesting smaller bird species (like warblers, flycatchers) through an almost daily effort by resident bird-watchers living on them or doing weekend visits. My farm 'habitat' for some 30 years outside Bengaluru, had revealed a wonderfully diverse bird life—and I assume a similar experience awaits me in and around Dharwad!

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I appreciate some relevant literature received from Neginhal and the late Uttangi, and wish to warmly thank Aasheesh Pittie for help with critical papers on Dharwad birds accumulated by this invaluable bird bibliophile, no more available with the above two. The bird list of Sabbithi Pavan (and photographs) sent to me recently for identifications

Photo: Indrajit Ghorpade



68. Great Grey Shrike *Lanius excubitor*

and peer review is gratefully acknowledged. For the excellent photographs selected for this article, I am beholden to my younger brother, Indrajit Ghorpade, him thereby adding some 'colour' to this effort of mine.

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69. Cinereous Tit *Parus cinereus*

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Photo: Indrajit Ghorpade

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Appendix 1

Dharwad area flora

[See Desai & Murthy (1950), Razi (1955), Ladwa & Patil (1961), Bharathi & Shivalingaradhya (1966), Razi (1972), and Uttangi (1985: 154–155) for more details of local flora. The most frequent, commonly seen plant species here are listed below, by alphabetical order of genus and species names]

Acacia chundra (Rottler) Willd.
A. concinna L.
A. leucophloea (Roxb.)
A. nilotica (L.) Del. ssp. *indica* (Benth.) Brenan
Acalypha indica L.
Acanthospermum hispidum DC
Achras sapota L.
Achyranthes aspera L.
Adhatoda vasica Nees
Aegle marmelos (L.) Corr. Serr.
Ageratum conyzoides L.
Albizia amara (Roxb.) Boivin
Albizia lebbeck (L.), Benth.

Aloe vera (L.) Burm. F.
Amaranthus viridis L.
Anacardium occidentale L.
Annona squamosa L.
Anogeissus latifolia (DC) Wallich ex Beddome
Artocarpus heterophyllus Lam.
Azadirachta indica Adr. Juss.
Bauhinia purpurea L.
B. racemosa Lam.
Bidens pilosa L.
Bombax ceiba L.
Boswellia serrata Roxb.
Bougainvillea glabra Choisy

Butea monosperma (Lam.) Taubert in Engl. & Prantl.
Cassia auriculata L.
C. fistula L.
Casuarina equisetifolia Forster & Forster f.
Chloroxylon swietenia DC.
Cocos nucifera L.
Crateva magna (Lour.) DC.
Crotalaria retusa L.
Croton bonplandianus Baillon
Dalbergia latifolia Roxb.
Datura metel L.
Diospyros melanoxyton Roxb.
D. montana Roxb.
Dodonaea angustifolia L. f.
Duranta erecta L.
Embilica officinalis Gaertn.
Eucalyptus spp.
Euphorbia rothiana Sprengel
Ficus benghalensis L.
F. racemosa L.
F. religiosa L.
Gliricidia sepium (Jacq.) Kunth ex Walp.
Gloriosa superba L.
Gmelina arborea Roxb.
Grevillea robusta A. Cunn ex R. Br.
Guizotia abyssinica (L. f.) Cass.
Hardwickia binata Roxb.
Hibiscus spp.
Impatiens fruticosa Leschen. ex DC
Indigofera cordifolia Heyne ex Roth.
Ipomoea pes-caprae (L.) R. Br.
Ixora spp.
Jasminum angustifolium (L.) Willd.
Lagascea mollis Cav.
Lagerstroemia parviflora Roxb.
Lantana camara L.
Lawsonia inermis L. Willd.
Leucas aspera (Willd.) Link
Loranthus spp.
Mangifera indica L.
Manilkara hexandra (Roxb.) Dubard
Michelia champaca L.
Millingtonia hortensis L. f.
Mimosa pudica L.
Mimusops elengi L.
Momordica charantia L.
Moringa oleifera Lam.
Morus alba L.
Murraya koenigii (L.) Sprengel
Nerium oleander L.
Nyctanthes arbor-tristis L.

Frequent Dharwad fauna

[See Neginhal (1981) for some general details]

Frogs, *Microhyla ornata*, *Polypedatus maculatus*, *Rana limnocharis*, *Tomopterna breviceps*
 Fivestriped Palm Squirrel, *Funambulus pennanti* Wroughton
 Threestriped Palm Squirrel, *F. palmarum* (Linnaeus)
 Indian Mongoose, *Herpestes edwardsi* (Geoffroy)
 Hanuman Langur, *Semnopithecus priam* (Blyth)
 Ghats Langur, *S. hypoleucos* (Blyth)
 House Rat, *Rattus rattus* (Linnaeus)

Ocimum basilicum L.
Opuntia monacantha (Willd.) Haw.
Ougenia dalbergoides Benth.
Pandanus odoratissimus L. f.
Parthenium hysterophorus L.
Peltophorum pterocarpum (DC) Backer ex K. Heyne
Phoenix sylvestris (L.) Roxb.
Phyllanthus emblica L.
Physalis minima L.
Pithecolobium dulce (Roxb.) Benth.
Plumeria spp.
Polyalthia longifolia (Sonnerat) Thw.
Pongamia pinnata (L.) Pierre
Premna latifolia Roxb.
Prosopis cineraria Druce
Pterocarpus marsupium Roxb.
P. santalinus L. f.
Randia dumetorum (Retz.) Poirer
Samanea saman (Jacq.) Merr.
Santalum album L.
Scapindus emarginatus Vahl
Scutellaria violacea Heyne ex Benth.
Semecarpus anacardium Linn.f.
Shorea talura Roxb.
Sida cordifolia L.
Solanum nigrum L.
Sonchus oleraceus L.
Spathodea campanulata P. Beauv.
Stachytarpheta mutabilis (Jacq.) M. Vahl
Stereospermum personatum (Hassk.) Chatterjee
Strychnos nux-vomica L.
Syzygium cuminii (L.) Skeels
Tamarindus indica L.
Tectona grandis L.
Terminalia arjuna Wight et Arn.
T. bellerica Roxb.
T. catappa L.
T. chebula (Gaertn.) Retz.
T. paniculata Roth.
T. tomentosa Wight et Arn.
Thespesia populnea (L.) Sol. ex. Corr. Ser.
Thunbergia spp.
Tridax procumbens L.
Viscum spp.
Vitex negundo L.
Xanthium indicum J. Koenig
Ziziphus mauritiana Lamk.

And several unidentified grasses*

*See Desai & Murthy (1950) for some grass species recorded from UAS, Dharwad campus

Bandicoot, *Bandicota indica* (Bechstein)
 House Mouse, *Mus musculus* Linnaeus
 Field Mouse, *M. booduga* (Gray)
 Pipistrelle, *Pipistrellus coromandra* (Gray)
 Large Fruit Bat, *Pteropus giganteus* Linnaeus
 Jackal, *Canis aureus* Linnaeus
 Blacknaped Hare, *Lepus nigricollis* F. Cuvier
 Blackbuck, *Antelope cervicapra* (Linnaeus)

Butterflies (Lepidoptera: Rhopalocera) of North Kanara were treated by Lionel de Niceville (1900), and of the Dharwad area by Ghosh *et al.* (1990). Dhulkhed (1959) listed the long-horned beetles (Coleoptera: Cerambycidae) of Dharwar [sic] Ghorpadé *et al.* (2013) wrote an account of the hawk moths (Lepidoptera: Sphingidae) of the Karwar–Dharwar [sic] transect. Kanamadi *et al.* (1990) wrote on common anuran amphibians prevalent in Dharwad.

Appendix 2

List of bird species recorded in Dharwad City and District

A total of 208 species are here confirmed from Dharwad and surrounds, including 24 doubtful ones [included in a separate section]; the recent work by my student Sabbithi Pavan (*in prep.*) has confirmed 105 species, and he has added ten more species to this list from the Dharwad city and district. The bird guides I use, when and if required to confirm species identifications, are Grimmett *et al.* (1999), Kazmierczak (2000), and Rasmussen & Anderton (2005).

Non-Passeriformes

- Lesser Whistling Duck *Dendrocygna javanica*
 Bar-headed Goose *Anser indicus*
 Ruddy Shelduck *Tadorna ferruginea*
 Common Pochard *Aythya ferina*
 Ferruginous Duck *A. nyroca*
 Tufted Duck *A. fuligula*
 Garganey *Spatula querquedula*
 Northern Shoveler *S. dypeata*
 Eurasian Wigeon *Mareca penelope*
 Indian Spot-billed Duck *Anas poecilorhyncha*
 Northern Pintail *A. acuta*
 Common Teal *A. crecca*
 Comb Duck *Sarkidiornis melanotos*
 Cotton Teal *Nettapus coromandelianus*
 Indian Peafowl *Pavo cristatus*
 Common Quail *Coturnix coturnix*
 Jungle Bush Quail *Perdica asiatica*
 Rock Bush Quail *P. argoondah*
 Grey Francolin *Francolinus pondicerianus*
 Grey Junglefowl *Gallus sonneratii*
 Greater Flamingo *Phoenicopterus roseus*
 Little Grebe *Tachybaptus ruficollis*
 Rock Pigeon *Columba livia*
 Eurasian Collared Dove *Streptopelia decaocto* [72]
 Red Collared Dove *S. tranquebarica*
 Spotted Dove *S. chinensis*
 Laughing Dove *S. senegalensis*
 Yellow-legged Green Pigeon *Treron phoenicopterus*
 Asian Palm Swift *Cypsiurus balasiensis*
 Alpine Swift *Tachymarptis melba*
 Pacific Swift *Apus pacificus* [Pavan *in prep.*]
 Indian House Swift *A. affinis*
 Greater Coucal *Centropus sinensis*
 Asian Koel *Eudynamis scolopaceus*
 Pied Cuckoo *Clamator jacobinus* [Pavan *in prep.*]
 Plaintive Cuckoo *Cacomantis passerinus* [Pavan *in prep.*]
 Common Hawk-Cuckoo *Hierococcyx varius* [65]
 Indian Cuckoo *Cuculus micropterus* [Pavan *in prep.*]
 White-breasted Waterhen *Amaurornis phoenicurus*
 Purple Swampphen *Porphyrio porphyrio*
 Common Moorhen *Gallinula chloropus*
 Common Coot *Fulica atra*
 Demoiselle Crane *Grus virgo*
 Great Indian Bustard *Ardeotis nigriceps* [64]
 Lesser Adjutant *Leptoptilos javanicus*
 Painted Stork *Mycteria leucocephala*
 Asian Openbill *Anastomus oscitans*
 Black Stork *Ciconia nigra*
 Woolly-necked Stork *C. episcopus*
 Cinnamon Bittern *Ixobrychus cinnamomeus*
 Indian Pond Heron *Ardeola grayii*
 Cattle Egret *Bubulcus ibis*
 Grey Heron *Ardea cinerea*
 Purple Heron *A. purpurea*
 Great Egret *A. alba*
 Intermediate Egret *Egretta intermedia*
 Little Egret *E. garzetta*
 Black-headed Ibis *Threskiornis melanocephalus*
 Eurasian Spoonbill *Platalea leucorodia*
 Indian Black Ibis *Pseudibis papillosa*
 Glossy Ibis *Plegadis falcinellus*
 Little Cormorant *Microcarbo niger*
 Black-winged Stilt *Himantopus himantopus*
 Yellow-wattled Lapwing *Vanellus malarbaricus*
 Red-wattled Lapwing *V. indicus*
 Pheasant-tailed Jaçana *Hydrophasianus chirurgus*
 Bronzewinged Jaçana *Metopidius indicus*
 Eurasian Curlew *Numenius arquata*
 Black-tailed Godwit *Limosa limosa*
 Sanderling *Calidris alba*
 Common Snipe *Gallinago gallinago*
 Common Sandpiper *Actitis hypoleucos*
 Common Greenshank *Tringa nebularia*
 Common Redshank *T. totanus*
 Wood Sandpiper *T. glareola*
 Barred Button Quail *Turnix suscitator*
 Little Pratincole *Glaucopis lactea*
 Little Tern *Sternula albifrons*
 River Tern *Sterna aurantia*
 Black-winged Kite *Elanus caeruleus*
 Oriental Honey Buzzard *Pernis ptilorhynchus*
 Egyptian Vulture *Neophron percnopterus*
 Crested Serpent Eagle *Spilornis cheela*
 Tawny Eagle *Aquila rapax*
 Western Marsh Harrier *Circus aeruginosus*
 Shikra *Accipiter badius*
 Brahminy Kite *Haliastur indus*
 Black Kite *Milvus migrans*
 White-eyed Buzzard *Butastur teesa* [63]
 Long-legged Buzzard *Buteo rufinus*
 Barn Owl *Tyto sternens* [Pavan *in prep.*]
 Spotted Owlet *Athene brama*
 Collared Scops-Owl *Otus bakkamoena*
 Great Hornbill *Buceros bicornis*
 Malabar Pied Hornbill *Anthracoceros coronatus*
 Malabar Grey Hornbill *Ocyrceros griseus*
 Indian Grey Hornbill *O. birostris*
 Common Hoopoe *Upupa epops*
 Indian Hoopoe *U. ceylonensis*
 Lesser Golden-backed Woodpecker *Dinopium benghalense* [66]
 Coppersmith Barbet *Psilopogon haemacephalus*
 Green Bee-eater *Merops orientalis*
 Blue-tailed Bee-eater *M. philippinus*
 Indian Roller *Coracias benghalensis*
 Common Kingfisher *Alcedo atthis*
 Pied Kingfisher *Ceryle rudis*
 White-throated Kingfisher *Halcyon smyrnensis*
 Common Kestrel *Falco tinnunculus*
 Plum-headed Parakeet *Psittacula cyanocephala*
 Rose-ringed Parakeet *P. krameri*
 Vernal Hanging Parrot *Loriculus vernalis*

Passeriformes

- Indian Pitta *Pitta brachyura*
 Small Minivet *Pericrocotus cinnamomeus*
 Large Cuckooshrike *Coracina javensis*
 Black-headed Cuckooshrike *Lalage melanoptera*
 Indian Golden Oriole *Oriolus kundoo*

Common Woodshrike *Tephrodornis pondicerianus*
 Common Iora *Aegithina tiphia*
 Black Drongo *Dicrurus macrocercus*
 Ashy Drongo *D. leucophaeus*
 White-throated Fantail *Rhipidura albicollis*
 Brown Shrike *Lanius cristatus*
 Bay-backed Shrike *L. vittatus*
 Rufous-backed Shrike *L. erythronotus*
 Long-tailed Shrike *L. schach*
 Great Grey Shrike *L. excubitor* [68]
 Rufous Treepie *Dendrocitta vagabunda*
 House Crow *Corvus splendens*
 Large-billed Crow *C. macrorhynchos*
 Indian Paradise-flycatcher *Terpsiphone paradisi*
 Thick-billed Flowerpecker *Dicaeum agile*
 Pale-billed Flowerpecker *D. erythrorhynchos*
 Plain Flowerpecker *D. concolor* [Desai et al. 2000; Pavan in prep.]
 Purple-rumped Sunbird *Leptocoma zeylonica*
 Purple Sunbird *Cinnyris asiaticus*
 Blue-winged Leafbird *Chloropsis cochinchinensis*
 Baya Weaver *Ploceus philippinus*
 Indian Silverbill *Eodice malabarica*
 White-rumped Munia *Lonchura striata*
 Scaly-breasted Munia *L. punctulata*
 House Sparrow *Passer domesticus*
 Paddyfield Pipit *Anthus rufulus*
 Western Yellow Wagtail *Motacilla flava*
 Grey Wagtail *M. cinerea*
 White-browed Wagtail *M. maderaspatensis*
 White Wagtail *M. alba*
 Grey-necked Bunting *Emberiza buchanani*
 Cinereous Tit *Parus cinereus* [69]
 Rufous-tailed Lark *Ammomanes phoenicura* [71]
 Ashy-crowned Sparrow Lark *Eremopterix griseus*

Oriental Skylark *Alauda gulgula*
 Sykes' Lark *Galerida deva*
 Grey-breasted Prinia *Prinia hodgsonii* [Pavan in prep.]
 Ashy Prinia *P. socialis*
 Plain Prinia *P. inornata*
 Common Tailorbird *Orthotomus sutorius*
 Sykes' Warbler *Iduna rama*
 Blyth's Reed Warbler *Acrocephalus dumetorum*
 Red-rumped Swallow *Cecropis daurica*
 Wire-tailed Swallow *Hirundo smithii*
 Barn Swallow *H. rustica*
 Dusky Crag Martin *Ptyonoprogne concolor*
 Red-whiskered Bulbul *Pycnonotus jocosus*
 Red-vented Bulbul *P. cafer*
 White-browed Bulbul *P. luteolus*
 Tytler's Leaf Warbler *Phylloscopus tytleri*
 Yellow-eyed Babbler *Chrysomma sinense* [70]
 Oriental White-eye *Zosterops palpebrosus*
 Large Grey Babbler *Turdoides malcolmi* [Pavan in prep.]
 Common Babbler *Argya caudata*
 Jungle Babbler *Turdoides striata* [Pavan in prep.]
 Yellow-billed Babbler *T. affinis*
 Rosy Starling *Pastor roseus*
 Brahminy Starling *Sturnia pagodarum*
 Blyth's Starling *Sturnia malabarica blythii* [Pavan in prep.] [67]
 Common Myna *Acridotheres tristis*
 Bank Myna *A. ginginianus* [see Taher et al. (2010)]
 Jungle Myna *A. fuscus*
 Indian Robin *Saxicoloides fulicatus*
 Oriental Magpie Robin *Copsychus saularis*
 Asian Brown Flycatcher *Muscicapa dauurica*
 Red-breasted Flycatcher *Ficedula parva*
 Pied Bushchat *Saxicola caprata*
 Indian Blackbird *Turdus simillimus*



71. Rufous-tailed Lark *Ammomanes phoenicura*

List of deleted species with explanatory notes

- Common Goldeneye *Bucephala clangula* Desai *et al.* (1999) mentioned sighting of this duck here, but misidentification is certain for some pochard; this species is unknown from below the Indo-Gangetic plains.
- Baer's Pochard *Aythya baeri* Uttangi (1996b) curiously mentioned this species from here but this is obviously a mistake since there are no records south of the Indo-Gangetic plains except for a record from Chilka Lake in Orissa on the east.
- Red Junglefowl *Gallus gallus* The record by Desai *et al.* (1999) is unacceptable for this species of 'sal' jungle above the Godavari and east of the Wainganga River.
- Black-necked Grebe *Podiceps nigricollis* The records of Uttangi (1985), and Desai *et al.* (1999) are unlikely for this species but there is a record from Pune.
- Emerald Dove *Chalcophaps indica* (Desai *et al.* 1999) have noted many species from the Dharwad area, which are highly unlikely, and this forest pigeon will hardly frequent this area and must be taken as incorrect.
- Oriental White Stork *Ciconia boyciana* Desai *et al.* (1999) again have erred with this record here; it is only known from north-eastern India.
- White-bellied Heron *Ardea insignis* Desai & Kallur (2001) gave this unlikely record for a north-eastern Indian species; see also Pittie (2002).
- Curlew Sandpiper *Calidris ferruginea* Desai *et al.* (1999) recorded this from here but pending confirmation it is better to omit this coastal species, although apparently seen in the Goa area and at Bengaluru (Kazmierczak 2000: 124).
- Northern Goshawk *A. gentilis* [Pavan *in prep.*] Record needs confirmation.
- European Roller *Coracias garrulus* Desai *et al.* (1999) mentioned a sighting, but I prefer to treat that as doubtful, even though there have been recent sightings in southern India from Goa, Kanakpura, *etc.*
- Black-capped Kingfisher *Halcyon pileata* Desai *et al.* (1999) give a record of this here,

- which is doubtful for this largely coastal species, though accidentals (?) have been seen in southern Karnataka and Tamil Nadu.
- Scarlet Minivet *Pericrocotus flammeus* Though there are several records from here (Uttangi, 1985; Desai *et al.* 1999; Pavan, *in prep.*), confirmation is required for this forest (ghats) species.
- Black-headed Shrike *Lanius tricolor* Desai *et al.* (2000) again probably erroneously mention this species, lumped under Long-tailed Shrike, *L. schach*, and found only in eastern India.
- Citrine Wagtail *Motacilla citreola* Desai *et al.* (1999) mention this but better to question it from here pending confirmation.
- White-capped Bunting *Emberiza stewarti* Desai *et al.* (1999) apparently misidentified this for Grey-necked?
- Black-faced Bunting *Schoeniclus spodocephala* Desai *et al.* (1999) apparently misidentified this for Grey-necked?
- White-naped Tit *Parus nuchalis* (Uttangi 1996a) was sure he identified this from here but his record needs confirmation.
- Zitting Cisticola *Cisticola juncidis* Desai *et al.* (1999)—record needs confirmation.
- Broad-tailed Warbler *Schoenicola platyurus* Desai *et al.* (1999)—record needs confirmation.
- Bristled Grass Warbler *Chaetornis striata* Desai *et al.* (2000)—record needs confirmation.
- Black-throated Tit *Aegithalos concinnus* Desai *et al.* (1999) documentation again, of a highly unlikely species here!
- Black Bulbul *Hypsipetes leucocephalus* Desai *et al.* (1999)—record needs confirmation.
- Rusty-tailed Flycatcher *Muscicapa ruficauda* Desai *et al.* (1999)—record needs confirmation.
- Pied Thrush *Geokichla wardii* Desai *et al.* (1999)—record needs confirmation.



72. Eurasian Collared Dove *Streptopelia decaocto*

Birds and trees in an urban context: An ecosystem paradigm for Vasant Vihar, New Delhi, India

Janaki Turaga

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Introduction

Avian diversity, and density, in and around urban conglomerations have been the focus of birdwatchers in a selective manner. Bird watching in urban areas has largely been confined, but not limited, to areas that are either protected, or still remain largely natural, such as protected areas, wetlands, ornamental parks, *etc.*, where it is relatively easy to observe large numbers of diverse birds. Sporadic reports of birds observed in residential or commercial urban areas have been reported. However, there is absence of data on avifauna supported by a micro-urban habitat, such as, a residential colony, commercial area, office complex, industrial area, *etc.* In the face of the increasing trends of rapid urbanisation, as well as the decrease and altering of the avifauna support areas in urban areas, it is necessary to know the avifauna supported by each kind of micro-urban habitat in order to obtain a comprehensive overview of avian status across an urban area.

New Delhi is one of the largest urban conglomerations of India, and next to Nairobi, Kenya, supports the largest diversity of birds (Harvey *et al.* 2006). This paper explores, delineates, and presents a broad overview of the bird density, and diversity of an urban residential area—Vasant Vihar (28.5574°N, 77.1590°E)—in New Delhi.

Methods

This paper emerged from my morning walks, in Vasant Vihar a residential colony of New Delhi, in April 2005. Intrigued by the diversity and density of birds that were observed in an urban residential colony, primarily along roadside trees, I undertook a more sustained observation in the month of April, through the following years 2006–2008. Additional observations, incidental to the main period of study, were made throughout the year, whenever I visited the area during 2005–2008. My personal observations over years, of the birds of Jawaharlal Nehru University (on a more sustained basis), and Lodhi Gardens (sporadically), from 1989 onwards, enabled me to roughly compare them with those of Vasant Vihar.

My objective was to arrive at a broad overview of the ground situation by ascertaining the diversity, presence, and the frequency of presence, of the birds, and their ecosystem support. Bird counting was deliberately not undertaken in this study, as the birds were dispersed over a large area, and could easily be re-counted when encountered on another street. The survey period each year was from 08–17 April 2005–2008. April marks the beginning of summer, and these dates corresponded to those of my first observation in 2005. I carried out observations from 0600–0800 hrs. Birds were observed with the aid of 10x50 Bushnell binocular. The data was supplemented by incidental

observations throughout the year over varying times and durations.

The primary areas of the study were the avenue trees, followed by major parks in the colony, sidewalk gardens of the houses, and trees in home gardens (observed from the roadside). Palam Marg, which marks the outer peripheral boundary of Vasant Vihar, was covered from beginning of the intersection of Palam Marg and Nelson Mandela Road, right upto Paschimi Marg of Vasant Vihar. Along this road not only avenue plantations, and avenue trees, but also the central verge (the divider between the two lanes of the road), which was planted with vegetation, and where birds nested, were covered. Within the residential colony, all the major arterial roads were covered, as well as other roads including the linking roads from Vasant Marg to Poorvi Marg, and from Poorvi Marg to Paschimi Marg. Parks on the roads covered were mainly unnamed, except for named parks such as the District Park on Poorvi Marg, the Municipal Corporation of Delhi's nursery on Vasant Marg, as well as the park adjacent to Anuj Vihar. The unnamed parks were observed from the roadside. Of the parks, Vasant Vihar District Park was more closely observed as it had wild as well as cultivated areas. A consolidated list of birds (Annexure 1), and trees (Annexure 2), was generated; I followed Krishen (2006) for the latter. Digital maps from Google Earth, of early 2006, are used as not only is that year closer to the beginning of the study in 2005, but in 2007, the topography of Palam Marg changed due to the construction of flyovers, which decimated its avenue plantations and trees. The data generated was analysed in the conceptual framework of Ecosystem Paradigm and the land use tool (see below).

Conceptual framework: The Ecosystem Paradigm

In order to understand the interlinkage between avenue trees and the birds dependent upon them, the data collected during the course of the walks was analysed through a specifically devised conceptual framework. This conceptual framework is the Ecosystem Paradigm, which is delineated below.

An 'urban ecosystem' has been operationally defined here as consisting of (a) urban systems, that is, built up area of the urban habitat—residential, commercial, and industrial; open spaces—water bodies, parks-gardens, waste management systems, and the resource flows within this system, as well as (b) the natural ecosystems, whether altered or pristine. The natural ecosystem is the template upon which the urban habitat is super-imposed. In the case of Delhi the urban habitat has broken its natural ecosystem, the 'Delhi Ridge', into isolated and fragmented patches. The urban habitat's residential, commercial, and possibly, industrial areas, are located in interlinked multiple micro-habitats and ecosystems, with each having its specific

character. Therefore, a conceptual framework, which links these different micro-habitats and ecosystems in the region from micro- to meso- to macro levels, is more likely to be useful for understanding the avian support system of the area, rather than focusing solely on the area under study. We assume that reasons for avifauna diversity are myriad but interlinked. The Ecosystem Paradigm approach of micro-meso-macro levels locates Vasant Vihar in the larger ecosystem—both regional, and international, the latter from the perspective of migrants that pass through it. The regional ecosystem is critical to understand Vasant Vihar's avian diversity and density. The international ecosystem gains prominence while studying international migrants and the ecosystems that support vast numbers of the birds, such as wetlands along the flyways, e.g., Okhla Bird Sanctuary, the Kolleru Ramsar site, Pulicat Bird Sanctuary, etc. However, the international ecosystem is a conglomeration of numerous regional ecosystems at the macro level, but at the micro- and meso levels is part of the regional ecosystem. Okhla Bird Sanctuary, which is part of the Central Asian Flyway that is one of the International ecosystems of India, can support avian density and diversity only if the regional ecosystem provides the necessary support. Any significant alteration in the regional ecosystems would impact the birds that are part of the international ecosystem. The continued absence of Siberian Cranes at Bharatpur, a Ramsar site, has been attributed to changes not merely in the inadequate support by the Regional ecosystem, but also by other regional ecosystems that are on their migratory path.

The regional ecosystem has been operationally defined as macro, meso, and micro. The ecosystem in which avifauna exist is an interplay of multiple ecosystems: The micro-, which is the geographical area under study; the meso-, which is the neighbourhood ecosystem, and consists of areas that are relevant to the micro-ecosystem; and the macro-ecosystem, within which, both the meso-, and micro-ecosystems are embedded, and defined. In this study, Vasant Vihar residential area is the micro-ecosystem. Its meso-ecosystem comprises the neighbouring areas of Ramakrishna Puram, Munirka, Jawaharlal Nehru University, Shankar Vihar, as well as the altered Ridge ecosystem that intersperses these areas. The macro-ecosystems in the context of Delhi, the natural ecosystems that define it are the Yamuna River, and the Delhi Ridge. Vasant Vihar is located on the Delhi Ridge, which is its macro-ecosystem, which sets its geographic and ecological contexts.

Each level of ecosystem is defined by its land use, which gives it, its unique character. Land use is an effective tool to understand the micro-ecosystem under study, as well as to build up the ecosystem layers and their inter-relationships. The land use of the micro-ecosystem: natural open spaces, developed spaces, parks, avenue trees, type and density of tree cover, and garbage management systems also influence its avifauna.

Discussion

Avenue trees and birds

Birds were primarily observed on avenue trees, which fact points to the critical dependency of urban birds, on avenue trees, for their biological requirements. This suggests that avenue trees play a critical role in supporting and promoting avifauna in a residential area. Extrapolating from this, given the increasing shrinkage of natural habitat in urban areas, avenue trees play a significant role in supporting and functioning as ecological refuges for urban avifauna. However, though the birds were primarily observed on

avenue trees, it is suggested that these trees play an important role for urban avifauna, in conjunction with the various other urban ecosystems, which are conceptualised in the Ecosystem Paradigm. Birds are dependent upon a variety of ecosystems for their sustenance. Of these, avenue trees, which are found across different kinds of urban land uses, such as commercial, industrial, and residential, play a significant role in providing a support system to urban avifauna.

Ecosystem support for the birds of Vasant Vihar: Ecosystem paradigm and land use

A comparison based on personal observations over several years (from 1989), of the avifaunal diversity supported by Vasant Vihar, shows that it is similar to that of Lodhi Gardens, which is a planned urban green space, and that of Jawaharlal Nehru University (JNU), which latter still has a large area with remnants of the original ridge ecosystem in its campus. Vasant Vihar serves as a 'transit' ecological refuge between the Ridge ecosystem—Southern-, South Central-, and Central Ridges, and the developed urban parks such as Deer Park, Lodhi Gardens, etc. The avenue trees along the roads serve as the critical link between different eco-zones, besides supporting avifauna in each area. They are transit ecological refuges because, we do not know as yet whether avenue trees provide complete support to the birds, and whether they form an independent ecosystem of their own. My observation is that the birds are dependent upon natural areas for their main food, and other biological requirements, and that avenue trees provide only support systems that are significant. The dependence upon avenue trees varies according to the type of trees that are planted—whether ornamental or fruiting—and the decline of traditional ecosystem support. Therefore, it is appropriate to consider avenue trees as 'transit ecological refuge' systems. Ecological corridors are more associated with terrestrial animals such as elephants, which not only provide support systems to them, but also link two main support systems. However, for birds it is difficult to state conclusively whether these are ecological corridors.

What is the ecosystem that supports these birds in Vasant Vihar? The conceptual framework of the Ecosystem Paradigm—where multiple levels of an ecosystem, i.e., macro-, meso-, and micro-ecosystems, are interlinked and combined with the tool of land use of the micro-ecosystem—is used to understand its avian avifaunal diversity and density.

In this ecological paradigm, the *Macro-ecosystem* is the predominant Ridge ecosystem, which defines the Vasant Vihar micro-ecosystem. In Fig. 1, Vasant Vihar is attached to three fragments of the Ridge. On its South-eastern side it is attached to the South Central Ridge through JNU and the adjoining Sanjay Van. On its western, and south-western sides it is attached to the Southern Ridge through the Muradabad Pahari Protected Forest (Anonymous 2013), and the abandoned quarried area (until 2005) with Vasant Kunj, respectively. It is attached in the north to the Central Ridge.

The original Ridge ecosystem has been modified over the years, beginning with the British, who tried to make the Ridge a habitable place not only by 'greening' it, but also by establishing New Delhi, the new capital, across it. Subsequently, after India's Independence, the Ridge was further colonised for human habitation. Only Mangarban, near Delhi, with its original Ridge ecosystem, is currently facing the threat of development initiatives by real-estate developers. While creating New Delhi, its planners

visualised a green area planted with exotic, and indigenous tree species where one road's aesthetic look was defined by one tree species, as seen in Lutyens' Delhi (Krishen 2006). However, the newly created colonies such as Ramakrishna Puram (RKP), Vasant Vihar, etc., did not follow the matrix of Lutyens' Delhi; they created a haphazard mix of all kinds of trees on a single road. While an urban area has isolated fragments of ecological refuge,

the avenue trees are spread all over the city and therefore, form an emerging but significant ecological niche for avifauna, especially given the increasing trend of continued alteration of the land use of the designated green spaces (e.g., Ridge, and green belt areas) in Delhi's master plan that enable increased human colonisation of the Ridge leading to its further fragmentation.

The *Meso-ecosystem* comprises the immediate neighbourhood ecosystem of Vasant Vihar. It is a combination of the wild and modified Ridge ecosystem, as well as the urban colonisation of the Ridge, both of which support avifauna (Fig. 2). Vasant Vihar is bound on its north by the sprawling residential colony of RKP with its 12 sectors; on the south by the disturbed ridge area between Vasant Kunj and Vasant Vihar, of which some part has now been developed into a series of shopping malls and office complexes that are collectively known as Vasant Kunj Malls (92 ha, developed from 2006), and some other comprising the Aravalli Biodiversity Park of 692 ha since 2004 (Anonymous 2015); on the south-eastern side by JNU, which still has tracts of undisturbed ridge ecosystem and is contiguous with the ridge ecosystem of the adjoining Sanjay Van forest of South Central Ridge; on the east by densely populated Munirka complex of the village and the three DDA apartment complexes; and on the west by Muradabad Pahari Forest and woodland area of 50 acres adjoining Anuj Vihar defense complex.

The meso-ecosystem is a mosaic of multiple land uses with varied tree cover that provide different kinds of support to avifauna. The degraded Ridge south of Vasant Vihar, which has now been partially developed into the Aravalli Biodiversity Park (from 2004 onwards), and the wild Ridge ecosystem, such as JNU and Sanjay Van that is so close to the built up area of Vasant Vihar, supports avifauna by providing a natural refuge. Muradabad Pahari Forest and woodland was highly degraded. Near its entrance ornamental flowering plants were planted while rest of the area had Vilaiti Keekar, and the shrub *Adhatoda justifica*, with a sole Bistendu *Diospyros cordifolia* tree.

RKP's tree-lined roads, houses with gardens and trees, are similar to those of Vasant Vihar. However, RKP's home gardens have numerous fruit trees such as Mango *Mangifera indica*, Bael *Aegle marmelos*, Gauva *Psidium guajava*, and Sonjna *Moringa oleifera*, which serve the requirements of its inhabitants. The predominance of these fruiting trees along with its avenue tree mix of native (e.g., Jamun *Syzigium cumini*), and

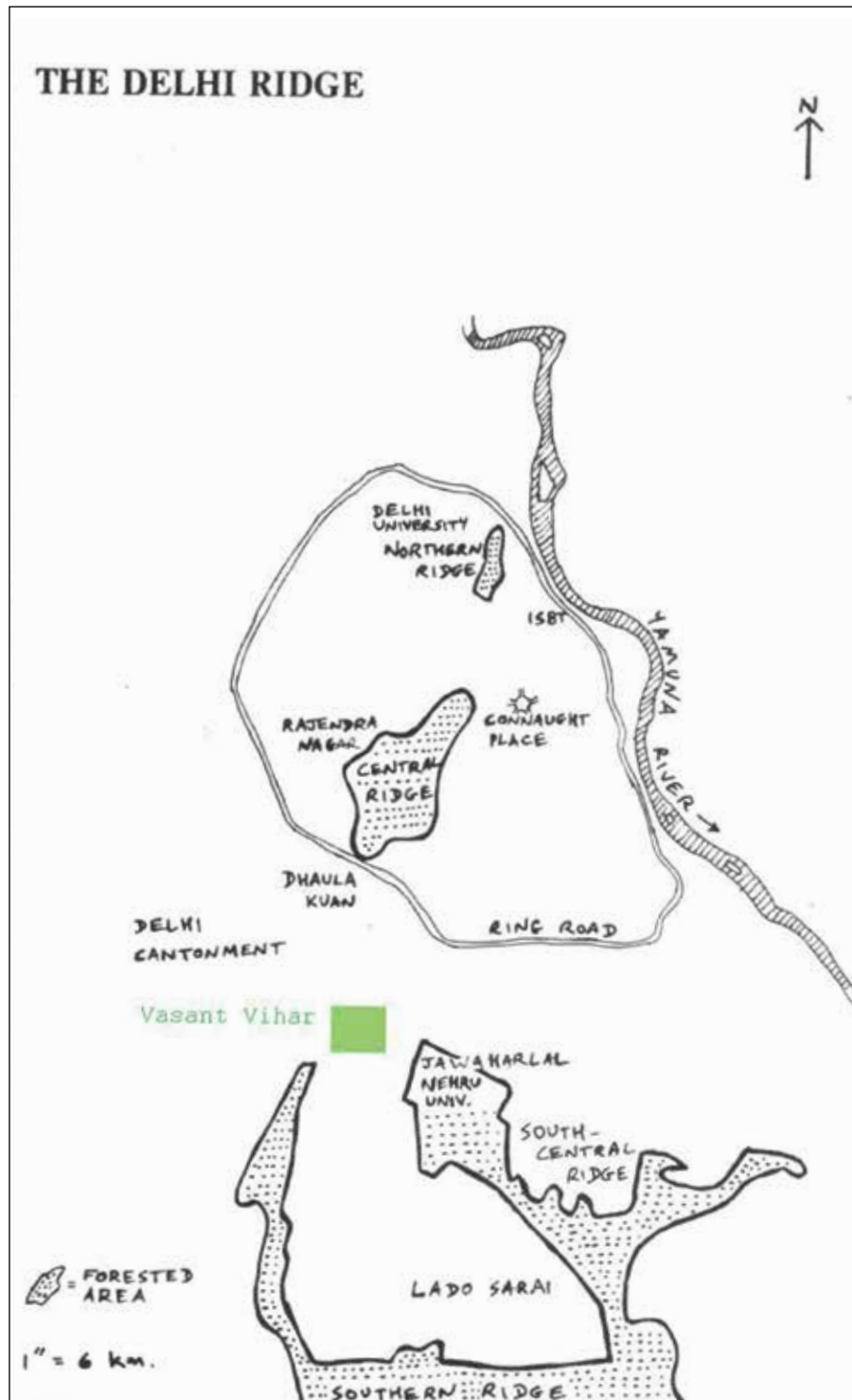


Fig. 1. Macro- ecosystem: The Delhi Ridge with Vasant Vihar whose area is not to scale with the rest of the map. Source: Adapted from Kalpavriksh 1991

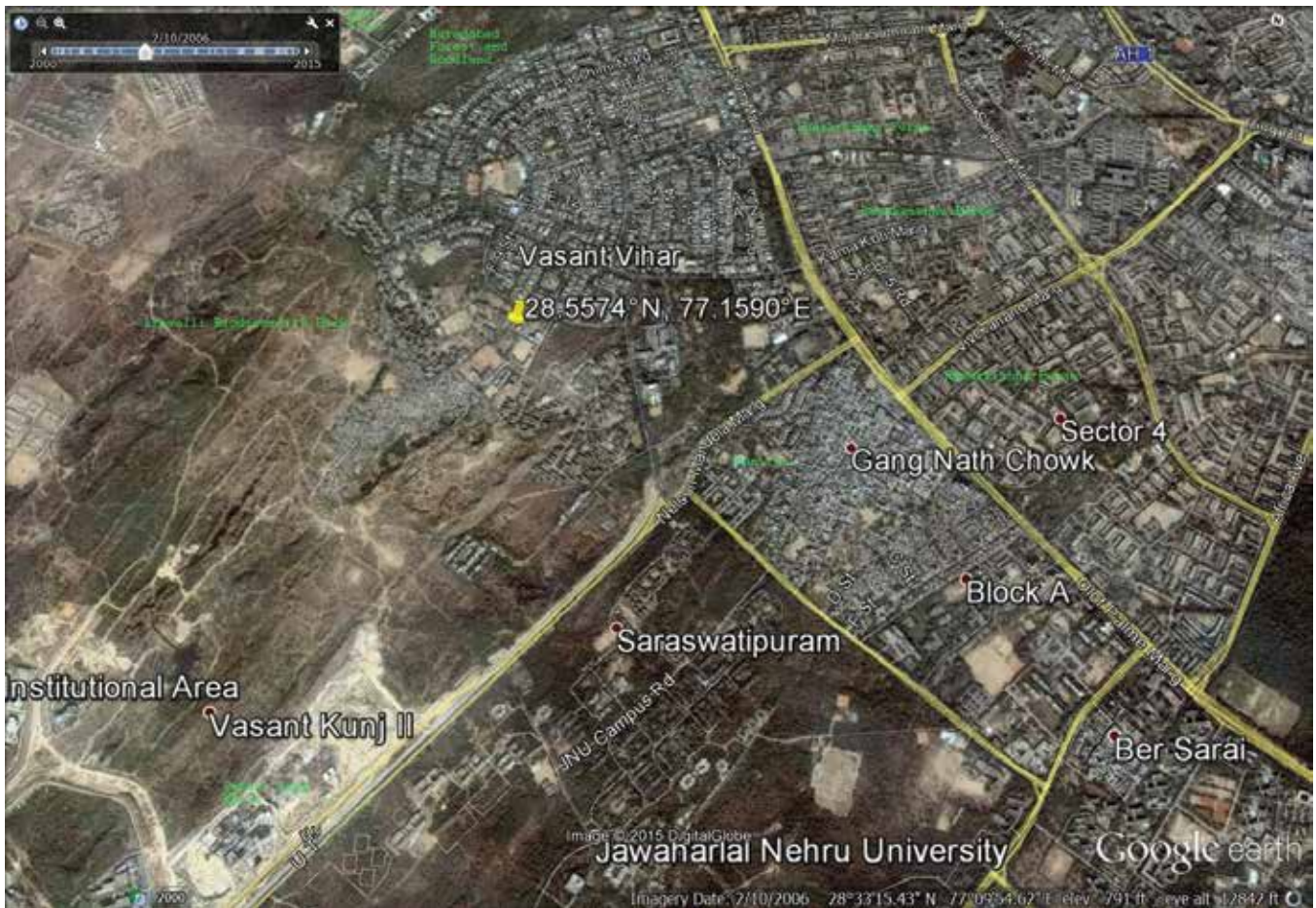


Fig. 2. Meso- ecosystem: Vasant Vihar's neighbourhood ecosystem. Source: Google Earth 2015

exotic trees, provides significant fruit food security to the birds. Decorative trees are few and sparse in these homes, unlike Vasant Vihar. Munirka's avifauna support is minimal due to its sparse tree cover that is mostly seen in its three DDA colonies, while the village is practically devoid of avenue trees and is heavily developed with multi-storey apartments.

The *Micro-ecosystem* comprises Vasant Vihar residential colony. This posh residential colony was planned and came up in the 1960s. Vasant Vihar's land use is a mosaic of residential, and commercial business complexes; a patch of protected forest, ornamental parks, and avenue trees, as well as waste management systems (Figs. 3 & 4). It is bound in the north by Palam Marg, in the south by Aravalli Diversity Park and abandoned mined Ridge area towards Vasant Kunj, in the east by Nelson Mandela Road, and in the west by Muradpur Pahari Forest and Woodland.

Vasant Vihar's habitat and land use

The micro-habitat of Kohi, which is the hilly tract of the Ridge, defines Vasant Vihar. It is this template that has been urbanised. The colony's original design was of bungalows with gardens. Since 2000 this has seen a gradual, accelerated conversion into a congestion of multi-storeyed residential apartments. In addition, over the years, there has been a gradual conversion of a primarily residential colony, into a commercial office area. This residential area buzzes with activity as there are schools (11), offices, and

commercial centers, which serve every block. Traffic is high around the commercial centers, and during school opening and closing time. The only 'water body' in Vasant Vihar is the drain that flows north-south, i.e., from RKP's Indira Market, into Vasant Vihar towards Basant Lok. This drain goes beyond, towards Vasant Kunj, and collects the storm water from the Palam Marg, and the Vasant- and Poonvi Margs of Vasant Vihar. The colony is relatively clean, as garbage is not disposed off haphazardly. There are numerous garbage dump points from where garbage is collected on a regular basis, but which provide avifauna support, e.g., Basant Lok's garbage dump adjoining Vasant Vihar District Park had a large concentration of Common Myna *Acridotheres tristis*, Bank Myna *A. ginginianus*, Black Kite *Milvus migrans*, House Crows *Corvus splendens*, etc. The tree cover is examined in the following sections.

The tree cover template of Vasant Vihar

The colony contains about 14 parks, most of which are ornamental. It has a protected forest—the District Park of 20 acres, a biodiversity park—the Aravalli Biodiversity Park, and a nursery of the Municipal Corporation of Delhi (MCD), which maintains tree cover in Vasant Vihar's parks and on its roads. However, in order to understand the avifauna support given by the tree cover, we need to deconstruct the multiple tree cover layers of Vasant Vihar.

Given the paucity of historical accounts and records about the vegetative cover of the area that was developed into Vasant

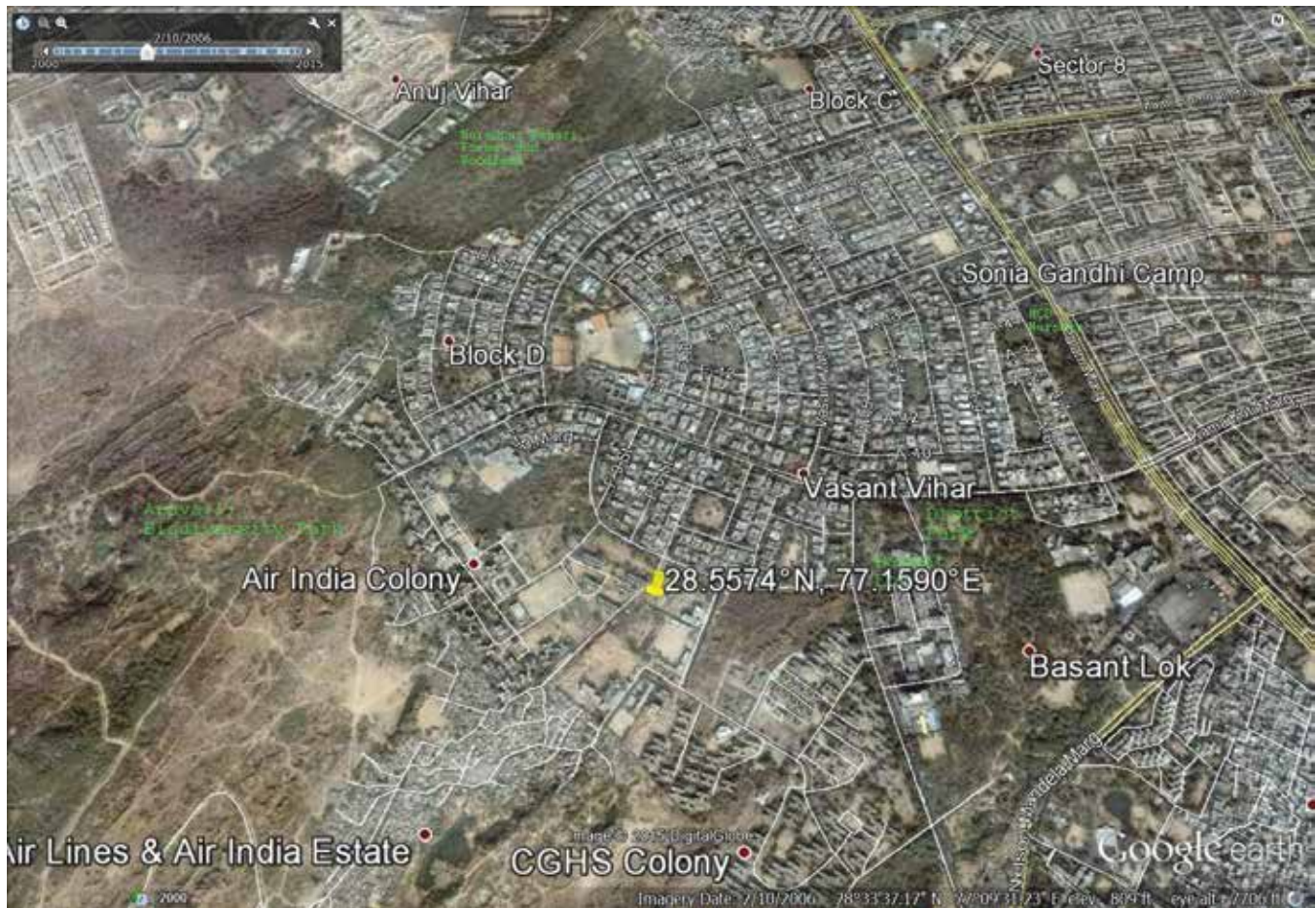


Fig. 3. Micro-ecosystem: Vasant Vihar and its Land use Source: GoogleEarth 2015

Vihar, we can attempt a partial reconstruction of its original Koshi vegetation, through documenting the existence of some scattered relics from the Ridge—a lone Hingot *Balanites roxburghii* tree, a few Ronjh *Acacia leucophloea* trees, and Babool *Acacia nilotica indica* trees. But the predominant vegetative layer is the result of the Delhi government's perspective of creating a beautiful residential colony, that is profusely planted with flowering trees drawn from the nearby region, the rest of India, and from other countries as widely scattered as Myanmar, Africa, Mexico, and Brazil. The government nursery run by Municipal Corporation of Delhi supplies plants to Vasant Vihar.

The third tree layer, is the home owners' own preferences of trees that they plant within their home gardens and the sidewalk gardens—exotics like the Royal Palm *Roystonea regia* jostle with Sonjna and Bael trees, as well as the seasonal flowering plants and bushes that mark their borders. Of late, decorative and hybrid plants are increasingly preferred as they beautify the apartment complexes and fit into cramped spaces. Vasant Vihar's vegetation is an interesting mix of native, regional, Indian, and exotic trees (Annexure 2). Unlike Lutyens' Delhi, there was no straitjacket scheme of tree planting for Vasant Vihar. Whatever was available was planted, and it created an interesting treescape with ornamental and non-ornamental trees where both Moulmein Rosewood *Millettia peguensis* and Goolar *Ficus racemosa*, figure in the scheme of avenue trees of Vasant Vihar. This hodge-podge of native, regional, pan-Indian, and exotic trees has provided not merely an aesthetic look to the human habitation, but more

critically, food security for birds, and insects too, and a year long supply of nectar, insects, and fruits, besides nesting and roosting facilities. We will now examine the tree cover template from the periphery to the core, that is, from Palam Marg towards the colony itself.

Palam Marg's tree cover consisted of avenue plantations, avenue trees, and the central verge. Palam Marg had a very high traffic density throughout the day and night. Its avenue plantations were located in few places such as at the intersection with Nelson Mandela Road, at the intersection of Poorvi Marg and Palam Marg, etc. Its avenue trees were located all along Palam Marg except for few isolated patches. The tree cover of both consisted Kassod *Senna siamea*, Forest Red Gum *Eucalyptus tereticornis*, Maharukh *Ailanthus excelsa*, Anjeeri *F. palmata*, Bakain *Melia azedarach*, Karanj *Pongamia pinnata*, Kosam *Schleichera oleosa*, Siris *Albizia lebbek*, Shisham *Dalbergia sissoo*, Pilokhan *Ficus virens*, Jodi *Ficus amplissima*, Semal *Bombax ceiba*, Acacia species—Vilayati keekar *Prosopis juliflora* and Babool, Ber *Ziziphus mauritana*, and Neem *Azadirachta indica*. Yellow Oleander *Thevetia peruviana*, and Oleander *Nerium oleander* were commonly planted. On the central verge, Neem, Karanj, Yellow oleander, Oleander, Vilaiti Keekar, Shisham, etc., provided nesting sites for birds.

However, post-2005, the construction of a series of flyovers on Palam Marg destroyed the avenue plantations and trees, which provided support to birds. The central verge, which provided nesting support to birds, has now ceased to exist. The

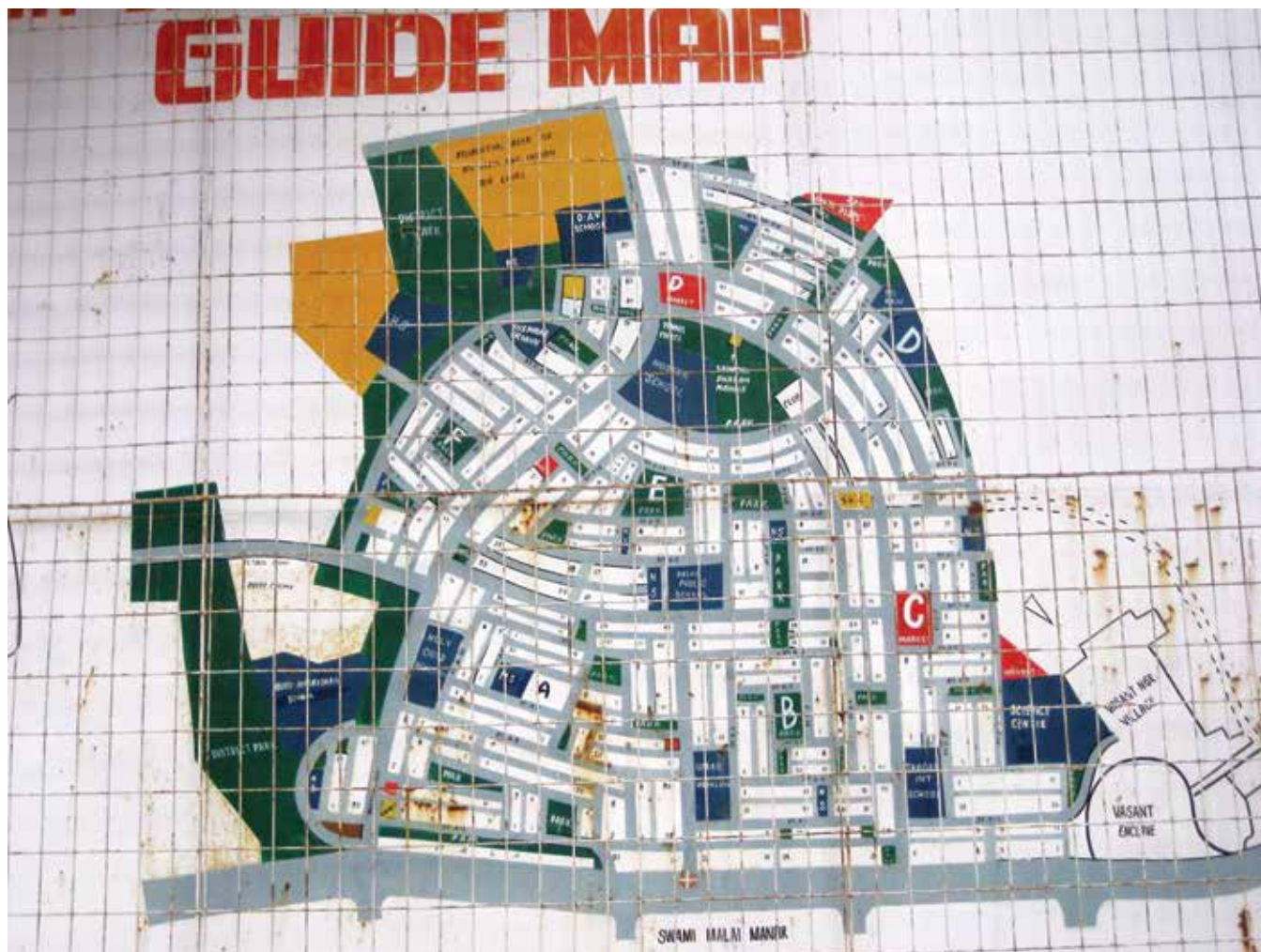


Fig. 4. Micro-ecosystem: Vasant Vihar and its Land use Source: Vasant Vihar Welfare Association Guide Map Signboard. Undated.

loss of such bird support areas should be factored in the study of a micro-ecosystem, where in some cases they play a critical role as bird support areas.

Vasant Vihar District Park had wilder vegetation, and beautiful old Ronjh trees along with 'beautifying' trees such as the Weeping bottlebrush *Callistemon viminalis*, etc. Except for two venues, a park adjacent to the MCD nursery, and the nursery itself, which have interesting and unique plant specimens, such as Ylang ylang *Cananga odorata*, Quickstick *Gliciridia sepium*, Krishna Fig *Ficus benghalensis* var. *Krishnae*, and the pink and yellow flowered *Tabebuias*, rest of the parks had decorative trees and plants. The trees alongside the drain and the nursery on Vasant Marg (the road running parallel to Palam Marg) contributed to the 'wooded' nature of the area.

The sidewalk garden fronts of houses, which are planted and nurtured by the residents, had an interesting mix of exotic trees, such as palms, border bush plants, etc. The residential gardens had not only exotics such as a Royal Palm, but also trees such as Bael, Sonjna, Mango, etc. In addition, seasonal flowering garden plants were common. These residential, and sidewalk gardens, form an interesting and contiguous tree cover along with the avenue trees, and government parks.

The preference for 'beautifying' the roads and the residential colony has resulted in a haphazard schema of a mix of indigenous

and exotic trees. The focus on beautiful flowering trees has skewed the tree mix more towards flowering trees rather than edible fruit trees, which ensured a fairly long flowering period, and provided nectar security to the birds, as well as insects, and bats. Only one solitary Imli *Tamarindus indica* avenue tree was found which indicated the planners' preference for creating an aesthetic environment. Though traditionally, Imli was a preferred avenue tree as it provided shade, shelter and cooling fruit to the weary travellers. Many old Grand Trunk Roads had Imli trees lining them, which today are rare to find on the modern highways.

On the interlinkages between birds and the trees in Vasant Vihar

Nature of birds found

At the micro-ecosystem level, avifauna diversity and density is the culmination of factors such as land use, tree and vegetation diversity and density, water bodies such as drains, tanks, etc., garbage and waste management, parks, and various types of buildings. Known avenue tree birds like the Indian Grey Hornbill *Ocyrceros birostris*, and the Yellow-legged Green Pigeon *Treron phoenicoptera* (Ali 1988), were rarely seen on avenue trees. Instead, they were found more in parks and gardens. This slight 'shift' could be possible due to the change in the composition

of avenue trees, from *Ficus*, Mango, Neem, Tamarind, Jamun, etc., to exotic species, and flowering trees. This, in addition to the pressure of high volume traffic, with the resultant atmospheric, and noise pollution was, possibly, not conducive for the habitation of the traditional roadside tree bird species such as the Indian Grey Hornbill. The decisive factor in tilting the balance in favour, or against, attracting birds is the composition of avenue trees.

Both native and international migrants were found in Vasant Vihar. The migratory birds were few; four species were spotted. One pair of Long-tailed Minivet *Pericrocotus ethologus* was observed chasing and calling to each other in the canopy of avenue trees in April 2005. Common Chiffchaff *Phylloscopus collybita*, and Lesser Whitethroat *Curruca curruca* were regularly spotted in the District Park. A Pied Bushchat *Saxicola caprata* pair was spotted only once in April 2007 when they were chasing each other in the canopy of avenue trees.

Palam Marg's avenue trees provided nesting sites for birds, plus diverse avifauna were seen—Ashy Prinia *Prinia socialis*, Purple Sunbird *Cinnyris asiaticus*, Black Kite (nesting on Eucalyptus trees), House Crow, Oriental White-eye *Zosterops palpebrosus*, Coppersmith Barbet *Psilopogon haemacephala*, Brown-headed Barbet *P. zeylanicus*, Black Drongo *Dicrurus macrocercus*, Common Myna, Asian Pied Starling *Gracupica contra*, Brahminy Starling *S. pagodarum*, Bank Myna, Red-vented Bulbul *Pycnonotus cafer*, etc. Despite the high traffic, and noise, the birds appeared oblivious to the din, and went about their business. The vulnerability of the nesting sites located on central verge, on trees with low heights with overhanging branches on the road, that could easily be demolished by passing vehicles, or predated upon, did not deter the birds from building their nests. Such a continual, and persisting, presence of birds on busy roads raised the question of the impact of the high levels of air and noise pollution on the birds and their young.

Most trees were flowering and fruiting, and diverse bird species were found, in good numbers, to be feeding, nesting, resting, etc., in them. Many avenue trees in Vasant Vihar had nesting holes of Common Mynas, Coppersmith Barbets, and Oriental Magpie Robins *Copsychus saularis*. Birds were present more in the avenue trees than in homes and parks.

The data for the breeding seasons of the birds is taken from Harvey *et al.* (2006). The breeding season of the resident native birds stretches from March through September, i.e., for seven months through spring, summer, and monsoon seasons. The second longest stretch is from December to October for 11 months covering winter to autumn. Year-round breeders are Grey Francolin *Francolinus pondicerianus*, Rock Pigeon *Columba livia*, House Sparrow *Passer domesticus*, and Brown Rock Chat *Oenanthe fusca*. Other birds with long breeding periods are Eurasian Collared Dove *Streptopelia decaocto*, House Crow (winter–autumn), Coppersmith Barbet, Large-billed Crow *C. macrorhynchos* (autumn–summer), and Rose-ringed Parakeet *Psittacula krameri* (winter–monsoon). This fairly diverse, and extended, breeding period of birds also relies on the food security that is provided by the micro-ecosystem of Vasant Vihar, which is now examined. At first, the nature of trees is delineated followed by the food security that the avenue trees of Vasant Vihar provide to the birds.

The most common avenue species were *Ficus*: Pilkhan, Banyan, and Peepal *F. religiosa*; Neem, Katsagon *Fernandoa adenophyllum*, Kassod, Karanj, Shahtoot *Morus alba*, Amaltas, Jamun, and Gulmohar *Delonix regia*. The predominance of keystone species such as *Ficus* (Gadgil & Guha 1992) provided

significant refuge and support to the bird life in that residential area. Some of the houses too had old trees, comprising *Ficus*, and others.

Vasant Vihar had an interesting heterogeneity of trees. But how did this work as a support system for birds? Nesting and roosting functions were common. Many birds nested and roosted here, from Black Kites to Coppersmith Barbets to the prinias. The food requirements of the birds fall broadly into two categories: the broad-spectrum omnivores, and the specialised insectivores, nectarivores, and frugivores. The tree cover of Vasant Vihar provided food security to cover both categories, especially nectar, of which a nearly year long supply is assured. The ficus trees also provided food for the birds for nearly seven months of the year, from February to October. The foliage also supported diverse insect species, which provided a steady supply of insects throughout the year. The garbage dumps provided food for the scavengers and omnivores.

The bulk of these birds are those found in urban areas and commensal with man. The associates of man such as Bank Myna, Common Myna, and House Crow appeared to be doing well and in fact thriving, but the House Sparrow was less visible. Food for the omnivorous House Sparrow was abundant in Vasant Vihar, but surprisingly the House Sparrow was not more commonly visible, while an insectivore like the Ashy Prinia, with a diet of insects, was thriving and was very common.

The flowering periods of all the tree species was spread throughout the year. The peak flowering season was summer, but a nearly year round supply of nectar was available from March to September, covering spring, summer and the monsoon. Many trees had a second flush (burst of flowering) during monsoon. Therefore, for seven months of the year, a continuous supply of nectar was available for the birds.

While there was a steady supply of nectar that was not the case with fruits, as most of the fruits were inedible for birds. Only some trees had fruits that were edible to birds. Some trees, like the Sausage tree *Kigelia africana*, have fruit that is edible for elephants in Africa, however, it is not known which birds consume them in Delhi. Trees with inedible fruit for birds are Copperpod *Peltophorum pterocarpum*, Siris, Harshingar *Nyctanthes arbor-tristis*, Forest Red Gum, Semal, White Silk Floss Tree *Ceiba insignis*, Caribbean Trumpet Tree *Tabebuia aurea*, Jarul *Lagerstroemia speciosa*, Saptaparni *Alstonia scholaris*, Chir Pine *Pinus roxburghii*, Kanak Champa *Pterospermum acerifolium*, etc. Fruit (both edible and inedible for birds) was produced throughout the year, though the peak fruiting season was summer. Edible fruit—both ficus and non-ficus—was available for birds throughout the year. The ficus species trees such as Peepal, Banyan, Pilkhan, Jodi, Goolar, Laurel Leaf Fig *F. microcarpa*, Weeping Fig *F. benjamina*, Anjeeri, etc., provided fruits not only during their peak season of Spring–Summer (March, April, May, June), but for most of the year that is from February to October. The non-ficus species trees such as Shahtoot, Mango, Guava, Chamrod *Ehretia laevis*, Neem, Jamun, Ber, Maulsari *Mimusops elengi*, Oleanders, and others, with their specific fruiting seasons altogether, provide fruits throughout the year. It was a common sight to see Plum-headed Parakeets *P. cyanocephala* along with Rose-ringed Parakeets feasting on the fruits of Shahtoot avenue tree.

Vasant Vihar ecosystem linkage with meso- and macro-ecosystems

Vasant Vihar is nested in a multi land use meso-ecosystem that

resonates with its own land use. These varied ecosystems are linked to each other as they are selectively connected with each other. The basic template of the Ridge, which is present both in meso- and macro-ecosystems, is present in Vasant Vihar as a patchy degraded remnant. Though every planned area's greenery is not the same as seen in limited tree cover in the Munirka DDA Flats complex when compared with Vasant Vihar and RKP, Vasant Vihar's planned greenery resonates with RKP's planned greenery. However, avenue trees are common elements and all pervasive. Therefore, the avifauna observed in Vasant Vihar is dependent on the support of varied ecosystems within and around Vasant Vihar. Vasant Vihar itself provides diverse support system for its avifauna. Its District Park is a degraded remnant of the Ridge, which is linked with the remnant ridge patches in its meso-ecosystem Vasant Kunj and JNU. Its ornamental parks and house gardens resonate with RKP colony's ornamental parks and house gardens. Its avenue trees link it with its meso-ecosystem's avenue trees and beyond that as avenue trees are across the urban area.

Birds as ecosystem indicators

Some areas that merit concern in future are reflected in the following questions: Can these birds be indicators of an urban ecosystem, such as the Common Sparrows are? Should we begin to get worried if these birds get sparse or disappear or there is a boom in their populations? Are they indicators of human lifestyle and habitat sustainability or unsustainability? Given that the Vasant Vihar Bird list has primarily birds, which are associated with man, how much significance can be attached to their adaptive nature? What is the extent of their capability to adapt to changing nature of human lifestyle and habitations? Would a change in the urban habitat such as a major shift from bungalows with gardens to multi-storeyed apartments impact bird density and diversity? Would urban concrete jungles support this common urban avifauna? Given the increasing shrinkage of natural green spaces and the increase in the built up area, what kinds of ecosystem support do resident, and migrant, avifauna need?

Conclusion

As Vasant Vihar, in terms of species diversity, was nearly equivalent to areas rich in birds such as Lodhi Gardens and JNU, the Ecosystem Paradigm and land use tool were used to understand the reasons for avifauna presence in Vasant Vihar. Though the land use of Vasant Vihar did provide significant support to the avifauna, it is unclear whether this is sufficient for the birds and whether this could be a stand-alone ecological refuge. However, it is very likely that meso-ecosystem, which is both residential area, mimicking that of Vasant Vihar, and part of the 'natural' ridge ecosystem, provides necessary support.

Vasant Vihar serves as a 'transit' ecological refuge between the Ridge ecosystem-South Central and South Ridges and the developed urban parks such as Deer Park, Lodhi Gardens, etc. The tree-lined roads serve as a continuous, but, critical link between different eco-zones besides supporting avifauna in each area, and are the more diffuse, 'invisible', and widespread areas supporting birds.

Avenue trees are 'ecological refuge' areas for birds in urban areas. Common urban avifauna is those associated with human beings and native tree species such as the Keystone *Ficus* species.

A well-planned tree cover for a residential area not only adds to the aesthetics of the area but supports avifauna, so very

integral to the urban ecosystem. With good vegetative cover—especially on roads and parks and house gardens—an urban neighbourhood can provide good support for diverse avifauna. The tree species should lean more on the regional and Indian, especially on keystone species such as *Ficus* and non-*Ficus* fruits which are consumable by birds, instead of exotics whose value lies mainly in providing nectar. Hence, urban planners should pay attention to the role of avenue trees in planning for urban areas, with special focus on *Ficus* trees, Neem, Jamun, Amaltas *Cassia fistula*, Babool, etc., and the local trees of the local and regional ecosystem which support local and regional avifaunas.

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Annexure 1

Bird List for the years 2005–2008

Indian Peafowl *Pavo cristatus*
 Grey Francolin *Francolinus pondicerianus*
 Rock Pigeon *Columba livia*
 Eurasian Collared Dove *Streptopelia decaocto*
 Spotted Dove *S. chinensis*
 Laughing Dove *S. senegalensis*
 Yellow-legged Green Pigeon *Treron phoenicopterus*
 Greater Coucal *Centropus sinensis*
 Asian Koel *Eudynamis scolopaceus*
 Indian Pond Heron *Ardeola grayii*
 Cattle Egret *Bubulcus ibis*
 Red-wattled Lapwing *Vanellus indicus*
 Shikra *Accipiter badius*
 Black Kite *Milvus migrans*
 Spotted Owllet *Athene brama*
 Indian Grey Hornbill *Ocyrceros birostris*
 Lesser Golden-backed Woodpecker *Dinopium benghalense*
 Yellow-crowned Woodpecker *Dendrocopos mahratensis*
 Brown-headed Barbet *Psilopogon zeylanicus*
 Coppersmith Barbet *P. haemacephalus*
 Green Bee-eater *Merops orientalis*
 Plum-headed Parakeet *Psittacula cyanocephala*
 Alexandrine Parakeet *P. eupatria*
 Rose-ringed Parakeet *P. krameri*
 White-throated Kingfisher *Halcyon smyrnensis*
 Long-tailed Minivet *Pericrocotus ethologus*
 Black Drongo *Dicrurus macrocercus*
 Rufous Treepie *Dendrocitta vagabunda*
 House Crow *Corvus splendens*
 Large-billed Crow *C. macrorhynchos*
 Purple Sunbird *Cinnyris asiaticus*
 Indian Silverbill *Euodice malabarica*

House Sparrow *Passer domesticus*
 Yellow-throated Sparrow *Gymnoris xanthocollis*
 White-browed Wagtail *Motacilla maderaspatensis*
 Ashy Prinia *Prinia socialis*
 Common Tailorbird *Orthotomus sutorius*
 Red-whiskered Bulbul *Pycnonotus jocosus*
 White-eared Bulbul *P. leucotis*
 Red-vented Bulbul *P. cafer*
 Common Chiffchaff *Phylloscopus collybita*
 Lesser Whitethroat *Currucula curruca*
 Oriental White-eye *Zosterops palpebrosus*
 Common Babbler *Argya caudata*
 Jungle Babbler *Turdoides striata*
 Asian Pied Starling *Gracupica contra*
 Brahminy Starling *Sturnia pagodarum*
 Common Myna *Acridotheres tristis*
 Bank Myna *A. ginningianus*
 Indian Robin *Saxicoloides fulicatus*
 Oriental Magpie Robin *Copsychus saularis*
 Pied Bushchat *Saxicola caprata*
 Brown Rock Chat *Oenanthe fusca*

Annexure 2

Tree List for the years 2005–2008
 African Tulip Tree *Spatodea campanulata*
 Alii Fig *Ficus binnedijkii*
 Amaltas *Cassia fistula*
 Anar *Punica ranatum*
 Anjeeri *Ficus palmata*
 Arjun *Terminalia arjuna*
 Arnatto *Bixa ovellana*
 Ashok *Polyalthia longifolia*
 Babool *Acacia nilotica indica*
 Bael *Aegle marmelos*
 Bakain *Melia azedarach*
 Banyan *Ficus benghalensis*
 Ber *Ziziphus mauritiana*
 Bistendu *Diospyros cordifolia*
 Caribbean Trumpet Tree *Tabebuia aurea*
 Chamrod *Ehretia laevis*
 Chandni *Taberaenamontana divaricata*
 Chikrassy *Chukrasia tabularis*
 Chir Pine *Pinus roxburghii*
 Copperpod *Peltophorum pterocarpum*
 Dhak *Butea monosperma*
 Fiddleleaf Fig *Ficus lyrata*
 Floss-Silk Tree *Ceiba speciosa*
 Forest Red Gum *Eucalyptus tereticornis*
 Frangipani *Plumeria rubra*
 Goolar *Ficus racemosa*
 Guava Tree *Psidium guajava*
 Gulmohur *Delonix regia*
 Harshingar *Nyctanthes arbor-tristis*
 Hingot *Balanites roxburghii*
 Imli *Tamarindus indica*
 India Rubber Tree *Ficus elastica*
 Indian Coral Tree *Erythrina variegata*
 Indian Tulip Tree *Tespesia populnea*
 Jacaranda *Jacaranda mimosifolia*
 Jadi *Ficus amplissima*
 Jaggery Palm *Caryota urens*
 Jamun *Syzygium cumini*
 Jarul *Lagerstroemia speciosa*
 Jerusalem Thorn *Parkinsonia aculeata*
 Jungle Jalebi *Pithecellobium dulce*
 Kachnar *Bauhinia variegata*
 Kadi Patta *Bergera koenigii*
 Kamini *Murraya paniculata*
 Kanak Champa *Pterospermum acerifolium*
 Kaniar *Bauhinia purpurea*

Karanj *Pongamia pinnata*
 Kassod *Senna siamea*
 Katsagon *Fernandoa adenophyllum*
 Kosam *Schleichera oleosa*
 Krishna Fig *Ficus benghalensis* var. *Krishnae*
 Laurel Fig *Ficus microcarpa*
 Maharukh *Ailantus excelsa*
 Mango Tree *Mangifera indica*
 Maulsari *Mimusops elengi*
 Morpankhi *Platyclusus orientalis*
 Moulmein Rosewood *Milletia peguensis*
 Mysore Fig *Ficus drupacea* var. *pubescens*
 Neem *Azadirachta indica*
 Oleander *Nerium oleander*
 Peepal *Ficus religiosa*
 Pilkhan *Ficus virens*
 Pink Trumpet Tree *Tabebuia impetiginosa*
 Putranjiva *Drypetes roxburghii*
 Quickstick *Gliricidia sepium*
 Rai Jamun *Syzygium nervosum*
 Ronjh *Acacia leucophloea*
 Royal Palm *Roystonea regia*
 Saptaparni *Alstonia scholaris*
 Sausage Tree *Kigelia africana*
 Semal *Bombax ceiba*
 Shahtoot *Morus alba*
 Shisham *Dalbergia sissoo*
 Silky Oak *Grevillea robusta*
 Siris *Albizia lebbek*
 Sonjna *Moringa oliefera*
 Subabool *Leucaena leucocephala*
 Thor *Euphorbia nerifolia*
 Vilaiti Keekar *Prosopis juliflora*
 Weeping Bottlebrush *Callistemon viminalis*
 Weeping Fig *Ficus benjamina*
 White Floss-Silk Tree *Ceiba insignis*
 White Frangipani *Plumeria obtusa*
 Yellow Bells *Tecona stans*
 Yellow Oleander *Thevetia peruviana*
 Ylang ylang *Cananga odorata*



'Tundra' Bean Goose *Anser fabalis rossicus/serrirostris* at Tahla Lake, Alwar district, Rajasthan

Harkirat Singh Sangha

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Photo: Sunil Singhal



The Bean Goose *Anser fabalis* breeds from northern Scandinavia eastwards across northern Asia. Five forms are generally recognised, three of which breed in the Taiga biome, and two in the Tundra. These two groups are treated as representing separate species by several authors, e.g., Brown (2010). However, the Bean Goose complex has enjoyed a complicated taxonomic history. Cramp & Simmons (1977), and del Hoyo *et al.* (1992) consider the Bean Goose to be a single polytypic species. But some recent works like Sangster & Oreel (1996), present strong cases to treat it as three monotypic species: Pink-footed Goose *A. brachyrhynchus*, Taiga Bean Goose *A. fabalis*, and Tundra Bean Goose *A. serrirostris*. However, Ruokonen *et al.* (2008) considered *A. middendorffii* a monotypic species, with the other four being races of a single species. In view of this uncertainty in taxonomy, Dickinson & Remsen (2013) treat it as a single species, with five races, which is also the case in Rasmussen & Anderton (2012), and del Hoyo *et al.* (1992).

The Bean Goose is an extreme rarity in the Indian Subcontinent, and is included in the 'Indian Checklist' based on three recent photographic records, and an old specimen (Praveen *et al.* 2014). Ali & Ripley (2001) included it in the *Handbook* on the basis of historical records, a majority of which remain unverified, and probably refer to other *Anser* species as well (Praveen *et al.* 2014). Rasmussen & Anderton (2005, 2012) included it in their work, based on recent sightings. Two recent Nepal records are from Chitwan National Park (Inskipp & Inskipp 1991; Robson 2004).

The serendipitous sighting at Tahla Lake (27.23°N, 76.42°E), also called Mara Sarovar, Alwar district, Rajasthan of Bean Goose was noted in the images posted on Delhi Birds by Sunil Singhal on 01 February 2015. The goose was picked out from amongst the gaggle of Greylag Geese *A. anser*, by Adesh Shivkar. Prompted

by the exciting discovery, Sunil Singhal again visited the lake on 11 February, 2015. He was lucky to find the bird again, as finding a single individual on a big lake was not easy, as c. 1500 geese (c. 300 Greylag, and c. 1200 Bar-headed Geese *A. indicus*) were present there till mid-February.

Sudhir Garg and I visited the lake on 14 February 2015. In very windy, and dusty, conditions it seemed like a gargantuan task to pick a Bean Goose from amongst c. 1500 geese. Aided by a 20x70 telescope, the bird was found after searching for some time. It gave good views for about a minute before getting lost in the mixed gaggle. By this time the angle of light had also become unfavourable to properly see the diagnostic features from the embankment. Therefore, we decided to change our location and soon found it in the company of a small flock of Greylag upending in the water. Disturbed by a fishing boat the geese took off after ten minutes but provided an opportunity to compare them in flight. Later it was found again in the company of a mixed gaggle of Greylag-, and Bar-headed Geese.

brown; the prominent white line at the upper border of flank was conspicuous. Undertail coverts and tail margin white.

The goose was seen five–six times in flight and showed dark wings, both above and below, and orangish-yellow legs. It was distinguishable from Greylag by the lack of pale forewing. Moreover, in flight, it appeared about ten per cent smaller than a Greylag Goose [73].

From a distance its bill appeared entirely dark. Only from close quarters, or when scoped, was the neat sub-terminal band of orange-yellow visible, on an otherwise black bill. Its legs and feet were a deep orange-yellow, and resembled the colours of the corresponding parts on a Bar-headed Goose.

Behaviour: It mixed freely with its congeners on the lake, while foraging, and roosting but would mostly 'stick' to a small sub-group of Greylag Geese, assumed to be the carrier species. Occasionally, it was seen alone, for short periods. It was generally more shy and wary, like the Greylag Geese, when compared with Bar-headed Geese, which were more approachable on the lake. Although the goose was observed five–six times in flight with the sub-group of Greylag Geese it was never heard calling.



73. Bar-headed-, Bean-, and Greylag- Geese in flight.

During a second visit to the lake on 22 February 2015 the number of Greylag- and Bar-headed Geese were less, but the sub-group of five–six Greylag Geese, with which Bean Goose was seen associating, was still there.

Field notes

Description: The Tahla bird was a stubby 'grey goose'; it generally differed in size and structure from a Greylag Goose, and gave an overall browner impression. Being a 'Tundra' type it was noticeably smaller than Greylag Goose with head rounded and bill short and relatively deep based.

The head and neck were brown, darkest on head. Upper breast brown. Mantle, scapulars and tertials were medium

Discussion

Although four records of the Bean Goose have been accepted for India, based on three recent photographic records, and an old specimen, it was not possible to comment on the races of these records given the poor diagnosability of all the evidences (Praveen *et al.* 2014).

Geographical variation in the Bean Goose is rather marked, but complex, owing to intergradations and individual variation in both, size, and bill pattern; it can be impossible to assign some birds to a particular subspecies in the field (Beaman & Madge 1998). However, the subspecies *fabalis* is about as large as a Greylag Goose, but has a narrower neck, smaller head, and slimmer bill and body; bill is usually long, and the amount of orange on it is variable. On the other hand, *rossicus* is slightly

smaller, has a shorter neck, and a darker head and neck, which contrast more markedly with its paler body, than in *fabalis* (Madge & Burn 1988; Kear 2005; Beaman & Madge 1998). Images [74-78] clearly show that this particular bird is much smaller than Greylags and has a shorter neck, and a darker head with very little orange on its short bill. This combination of features eliminates all three 'Taiga' forms of Bean Geese, and leaves only the two 'Tundra' races: the western *rossicus*, and the eastern *serrirostris*. The eastern *serrirostris* is apparently the larger of the two (wing of male 440–524 mm vs 430–478 mm) but field separation may not be possible on current knowledge (Carboneras *et al.* 2014).

In reality it is not possible to identify every individual Bean Goose with a complete certainty (Brown 2010). Fortunately, it was possible to assign the Tahla bird to the 'Tundra' group based on extended observations in good light conditions, and the availability of several good quality photographs.

The Bean Goose was discovered at Tahla on 01 February 2015, and was last seen there on 03 March 2015, with sub-groups Greylags.

The rarity of the Bean Goose in our part of the world is explained by the fact that it is less likely, than other species, to move southwards at the onset of hard weather, as it is able to use

its bill to probe in the snow, and also changes its food to taller crops (Philippona 1966).

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74. Bean Goose





76. The Bean Goose is much smaller than the other two geese.



77. Bean Goose with characteristic black beak.

Photos: Sudhir Garg

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78. Bean goose with Gray lag.

Photo: Sandeep Singh

Diversity of winter avifauna in Dheer beel, Assam, India

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Dheer beel, situated in western Assam, India, is a major wetland in the Brahmaputra Valley (Saikia & Bhattacharjee 1993). It is listed as an Important Bird Area (IBA) under the Chakrashila complex (Islam & Rahmani 2004; Fig. 1). The complex includes Chakrashila Wildlife Sanctuary, and Dheer-, Diplai-, and Dakra- beels. Beels are oxbow lakes / cut-off meanders with static water in the Ganges–Brahmaputra floodplains. These lesser-known wetlands are major bird habitats and an important wintering ground for many migratory species. Assam itself is immensely rich in avifaunal diversity with 900 species and subspecies (Choudhury 2000) recorded; roughly half of the 160 species utilizing beels are migratory (Choudhury 2000).

Waterbirds can broadly be defined as species ecologically dependent on wetlands. They are a key attribute of these ecosystems, forming vital links in food webs (Kumar *et al.* 2003). Waterfowl counts also form one of several elements used to identify important wetlands (Wei & Mundkur 2004).

Despite the importance of Dheer beel, it remains unprotected. It also lacks a comprehensive checklist of the rich array of residential and migrant avifauna. We studied the winter avifaunal diversity in Dheer from 2005–2007, and recorded 62 species of birds belonging to 17 families. Anatidae had the highest representation (13 species), followed by the Scolopacidae (eight). We compared changes in trends of the species diversity over two winters.

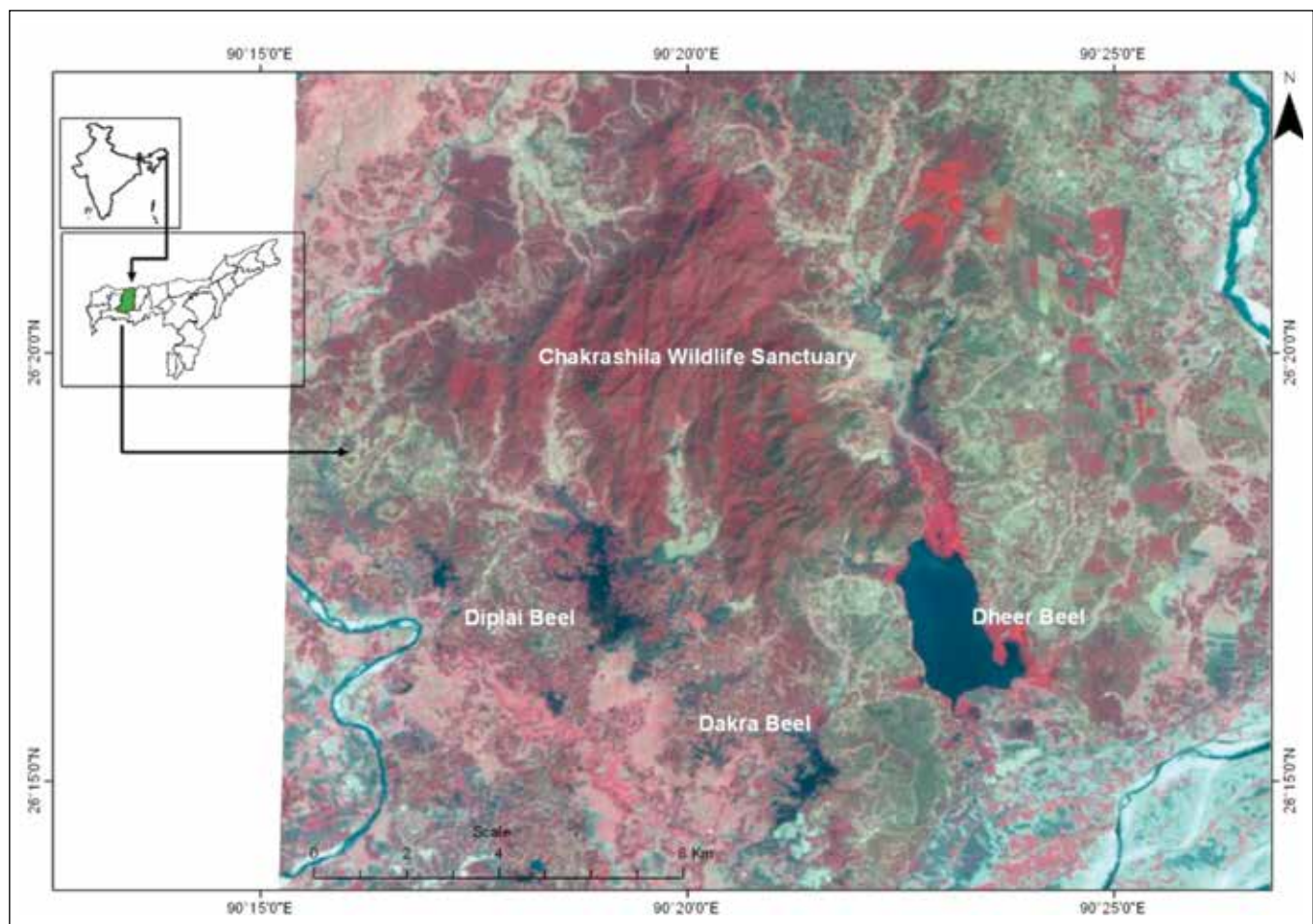


Fig. 1. Location of Dheer Beel, a freshwater lake, Chakrashila Wildlife Sanctuary, Diplai beel, and Dakra beel Assam, India

Study area

Dheer *beel* (26.282°N, 90.380°E) is located in the Dhubri District of western Assam. It comprises an area of 577 ha and is linked by a narrow channel, intersecting NH31, to River Brahmaputra. On its north-western side is Chakrashila Wildlife Sanctuary.

Most of the *beel* is clear, with floating vegetation, mostly water hyacinth *Eichhornia* sp., scattered over the lake. Fishermen accumulate the hyacinth in places, to form a clump called '*katal*', under which fish are known to seek refuge. Bamboo poles are erected in the *katal* to hold the hyacinth together, serving as perches for birds such as cormorants (Phalacrocoracidae) (Singha *et al.* 2004). Emergent and submerged vegetation in the *beel* also abounds, common species being *Scirpus*, *Hydrilla*, *Sagittaria sagittifolia*, *Trapa natans*, and *Vallisneria*. The *beel* has a rich fish and insect diversity. 36 species of fish have been reported from the wetland (Singha *et al.* 2007), and at least 12 species of insects have been recorded from here (Munmun Brahma, *pers. com*). Agriculture, mainly rice, is carried on along the edges of the *beel*, and has become a habitat for waders.

Methodology

We developed a Geographic Information System map of the *beel*, the location of the villages, the drainage system, and the land use/land cover pattern (Fig. 2). Ground truthing was carried out in and around the wetland including in the surrounding

villages of 19 locations.

We studied the winter avifaunal assemblage of the wetland and distributed our survey period into peak winter season (December–April) at an interval of every 15 days. As waterbirds are readily counted because many species congregate conspicuously (Wei & Mundkur 2004), we employed a standard method of sampling technique (Javed & Kaul 2003) following Singha *et al.* (2007). We counted birds in the morning hours (0700–1100 hrs) using a country boat at a constant speed. The boat was rowed with assistance of the locals, starting from one end, and encircling almost 50 per cent of the open water. We also travelled by boat to the periphery of the lake to record waders. To avoid double counting, we did not count birds, which landed in front of us flying in from the rear as well as from either side (Singha *et al.* 2004). On the return route to the starting point, neither individuals nor flocks were counted. Though we tried to be accurate in our counts, we do not rule out that some waders might have been missed, thereby reducing the actual number of birds.

We conducted interviews and held informal discussions with 41 households in the villages surrounding the wetland, using a pre-formatted, standardised questionnaire to gauge the dependency of the people on the wetland. Information on the socio-economic status was also obtained through interviews. We also tried to seek an insight into people's perception towards the conservation of the wetland.

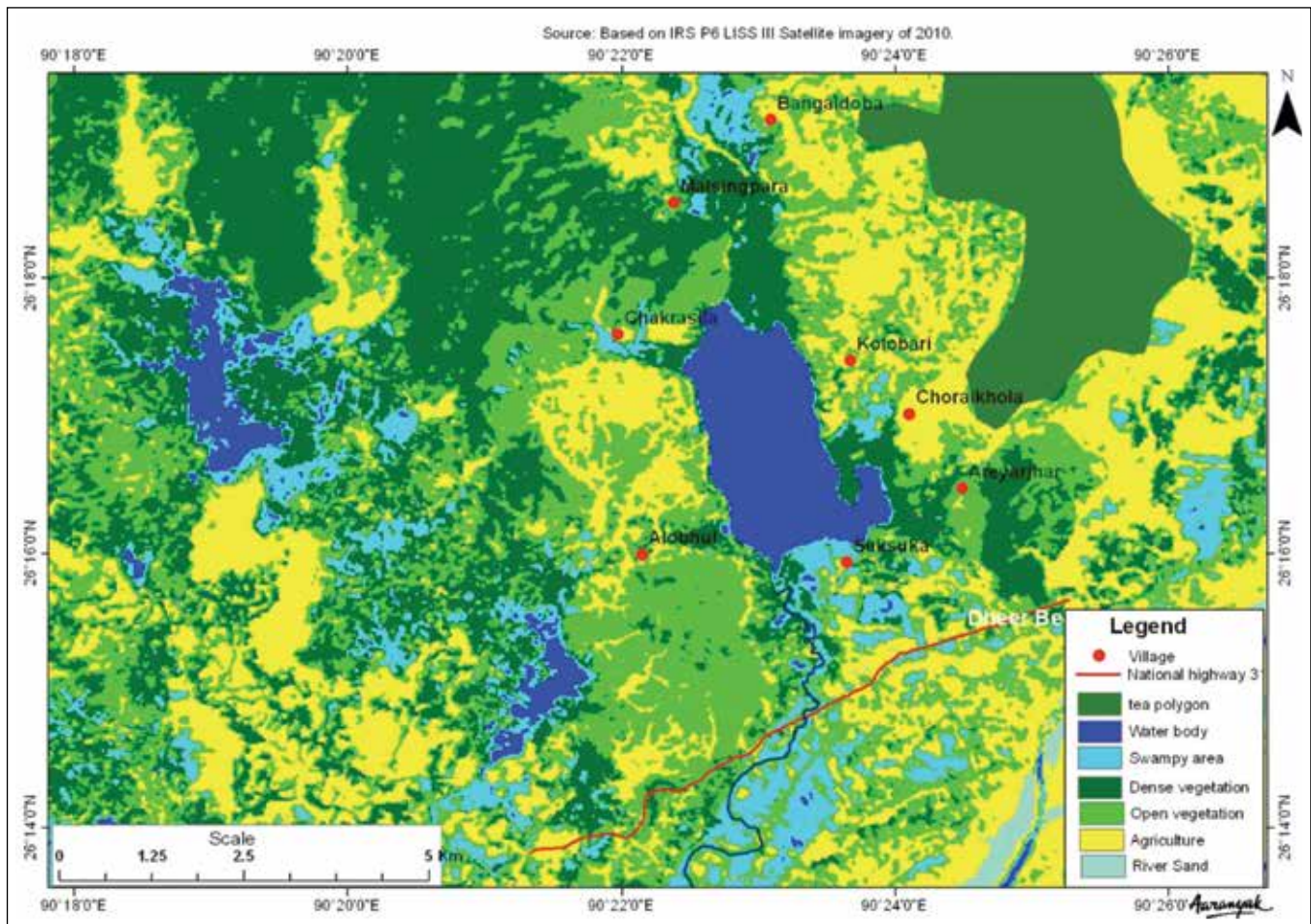


Fig. 2. Land use/land cover map of Dheer *beel* and its surrounding area, Assam, India.

Though data were collected in the same interval of 15 days in two subsequent winter seasons, the dates of collection differed by one day, in both seasons. For purposes of comparison of the data from the two seasons, we have simplified the time scale here as 'first fortnight', 'second fortnight', and so on. These observations were plotted on the X-axis; and the corresponding data of number of birds, as well as number of species, of both winter seasons were plotted on the Y-axis.

The avian species diversity of both years, during each fortnight, and for the entire season in entirety, was calculated using the Shannon-Weiner Index. We have compared how species diversity changed with temporal progress.

Results & discussions

A total of 62 species of birds, belonging to 17 families, were recorded from the study area (Appendix). These included 44 species of birds from the year 2006–2007, and 54 from 2005–2006. The family Anatidae, with 13 species, had the highest representation, followed by Scolopacidae, with eight species. Of these, 57% and 48%, respectively, were winter visitors for 2005–2006, and 2006–2007.

A decreasing trend, though not constant, with little fluctuation both in number of species and individuals, was found in relation to temporal progress in both seasons (Figs. 3 & 4). Winter migrants formed the bulk of the avifaunal community, and thus the gradual decrease in number of species, as well as of individuals, can be explained by the departure of migratory birds as winter progressed to spring. It is seen that by mid-April, the wintering bird community declined in the wetland. We noted the highest congregations of birds in January. However, we were unable to study the wetland prior to December; but it is likely that the migratory species started coming in from late September–October. The species diversity graph shows two peaks (Fig. 5), one during December–January, and another in March. The species diversity curves in two consecutive seasons, showing the same trend, prove that the waterbird community in Dheer *beel* follows

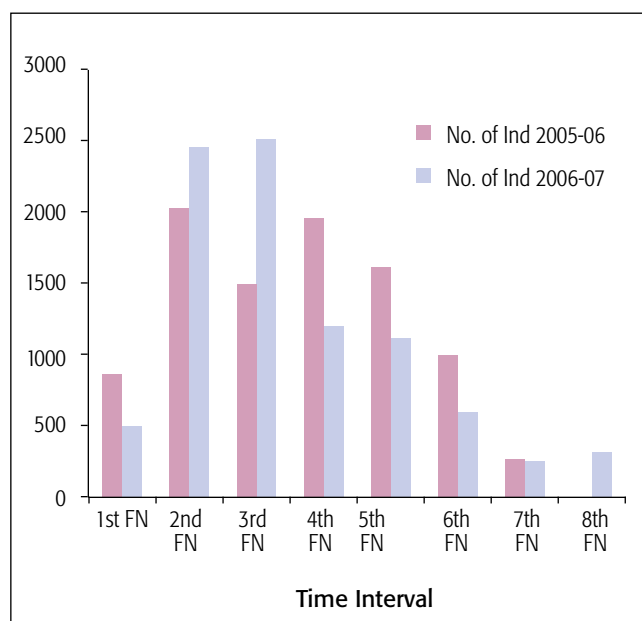


Fig. 3. Population trend of waterbirds with respect to the temporal progress (fortnightly=FN) in two consecutive winter seasons (2005–2006 & 2006–2007) in terms of number of individuals of birds.

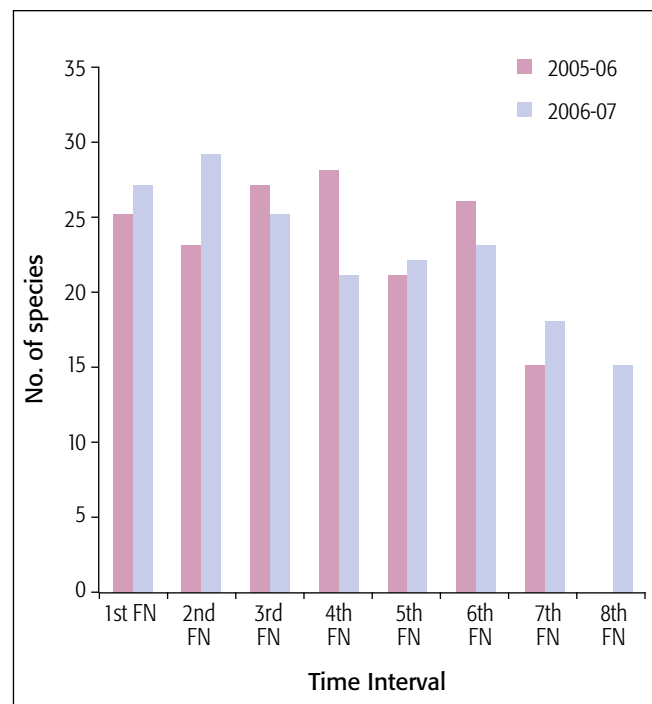


Fig. 4. Number of waterbird species with respect to the temporal progress (fortnightly=FN) in two consecutive winter seasons (2005–2006 & 2006–2007).

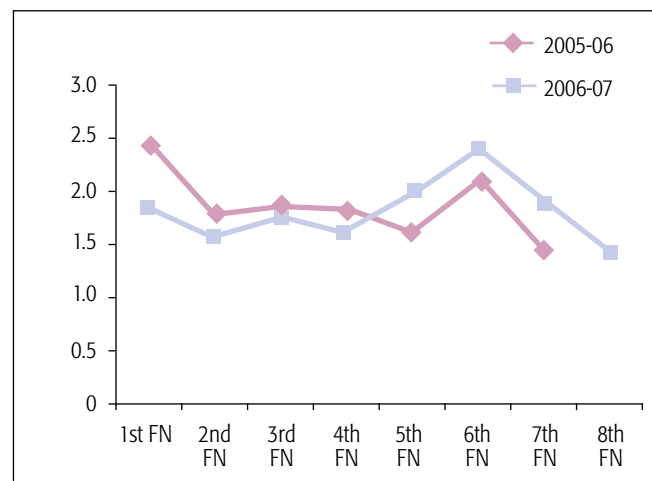


Fig. 5. Fluctuation of species diversity of waterbirds in Dheer *beel* with respect to the temporal progress (fortnightly=FN) in two consecutive winter seasons (2005–2006 & 2006–2007).

a definite pattern. We have already explained the congregation of waterbirds in January; however, the second peak observed in March was due to an increase in the numbers of some local species like Lesser Whistling Duck *Dendrocygna javanica*, and Little Grebe *Tachybaptus ruficollis*. Besides a constant population of most of the local birds, these two species were found to reach their maximum population in March.

Our study reveals that Dheer *beel* has a high avifaunal diversity. It attracts many migratory birds in winter, including two globally threatened species: Ferruginous Duck *Aythya nyroca*, and Baer's Pochard *A. baeri*. During the study, we encountered 39 Ferruginous Ducks in March 2005, and 26 in February 2006, and a flock of eight Baer's Pochards in December 2006. There are two previous reports of about 500 Ferruginous Ducks in January

1991, and 328 in 1992 from the *beel* (Choudhury 2000). Besides Dheer *beel*, 565 Ferruginous Ducks was recorded in January from Diplai *beel* (Choudhury 2000).

During the Annual Asian Waterbird Census in 1994, 19,828 birds belonging to 43 species were counted at Dheer *beel*. This number increased to 26,433 in 1995; but the total number of species remained the same. The population declined in 1996 to 7,102 but the number of species seen was 41 (Lopez & Mundkur 1997). In 1994 a total of 3,224 individuals belonging to 37 species, and 2,409 birds of 20 species were recorded from Diplai *beel*, and Dakra *beel* respectively.

The maximum number of birds counted was 1,934 and 2,495 in 2006 and 2007, respectively. The sharp decline in the number of individuals at Dheer *beel* in a span of more than ten years can be attributed to a number of reasons. The expansion of agriculture and human settlements, and occasional hunting are the key reasons. A major issue is fishing with fine mesh nets that ensnare even fingerlings (Islam & Rahmani 2004). A study of two consecutive winter seasons is insufficient to draw convincing conclusions, and a detailed round-the-year assessment of birds of the wetlands, and an assessment of threats to them is needed.

In both winters, Anatidae represented the greatest number of species. It is pertinent to mention here that during surveys from January 1985 through January 1993, Saikia & Bhattacharjee (1993) recorded Anatidae as the second largest wetland bird family among the 122 species belonging to 19 families in the Brahmaputra Valley.

From our study it is clear that growing paddy, near the edge of the *beel* and on all sides, has been a common practice that may lead to siltation. On the north-western side of the *beel* particularly, a major portion of the wetland has been transformed into paddies. However, it was found that fishing did not comprise the major livelihood of people living around the lake. Yet they opined that the *beel* be conserved mainly for irrigating for their paddy fields, and for fishing. Interestingly, there were very few illiterate people in the villages surrounding the wetland. Though a majority of them were under-privileged, a few educated youth are keen to work towards conserving the wetland. This provides an opportunity to work with them to organise a wetland awareness and conservation campaign for the people living around the *beel*.

Despite its local importance for waterbirds, and people, the Dheer *beel* remains an unprotected area; only the local people, who are interested in its conservation, safeguard it. For many years, conservationists have been demanding the inclusion of

Dheer-, and Diplai- *beels* into the boundaries of Chakrashila Wildlife Sanctuary, but the request is pending with the union ministry. We advocate and encourage authorities to extend the boundary of the sanctuary for inclusion of these wetlands after due scientific appraisals.

Acknowledgements

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Appendix: Checklist of birds recorded in Dheer *Beel*, Assam during (December–April) of 2005–2006 & 2006–2007. The distributional status, and status in Assam follow Choudhury (2000), and the conservation status follows IUCN 2013.

	English name	Scientific name	2005–2006	2006–2007	Distributional status	Conservation status	Status in Assam
I	ANATIDAE						
1.	Gadwall	<i>Mareca strepera</i>	1	1	W	LC	C
2.	Lesser Whistling Duck	<i>Dendrocygna javanica</i>	1	1	R	LC	C
3.	Eurasian Wigeon	<i>M. penelope</i>	1	1	W	LC	C
4.	Baer's Pochard	<i>Aythya baeri</i>	1	1	W	En	U
5.	Common Teal	<i>Anas crecca</i>	1	1	W	LC	C
6.	Mallard	<i>A. platyrhynchos</i>	1	1	W	LC	C
7.	Northern Pintail	<i>A. acuta</i>	1	1	W	LC	C
8.	Northern Shoveller	<i>Spatula clypeata</i>	1	1	W	LC	C
9.	Red-crested Pochard	<i>Netta rufina</i>	1	1	W	LC	U
10.	Ferruginous Duck	<i>A. nyroca</i>	1	1	W	NT	U
11.	Garganey	<i>S. querquedula</i>	1	1	W	LC	C
12.	Common Pochard	<i>A. ferina</i>	1	0	W	LC	C

Appendix: Checklist of birds recorded in Dheer Beel, Assam during (December–April) of 2005–2006 & 2006–2007. The distributional status, and status in Assam follow Choudhury (2000), and the conservation status follows IUCN 2013.

	English name	Scientific name	2005–2006	2006–2007	Distributional status	Conservation status	Status in Assam
13.	Tufted Duck	<i>A. fuligula</i>	1	1	W	LC	C
II	CHARADRIIDAE						
14.	Northern Lapwing	<i>Vanellus vanellus</i>	1	1	W	LC	C
15.	Grey-headed Lapwing	<i>V. cinereus</i>	1	1	W	LC	C
16.	Red-wattled Lapwing	<i>V. indicus</i>	0	1	R	LC	C
17.	Pacific Golden Plover	<i>Pluvialis fulva</i>	1	1	W	LC	C
18.	River Lapwing	<i>V. duvaucelii</i>	1	0	R	LC	U
19.	Little Ringed Plover	<i>Charadrius dubius</i>	1	0	R	LC	C
20.	Greater Sand Plover	<i>C. leschenaultii</i>	1	0	W, P	LC	U
III	ARDEIDAE						
21.	Great Egret	<i>Ardea alba</i>	1	1	R	LC	C
22.	Intermediate Egret	<i>A. intermedia</i>	1	1	R	LC	C
23.	Little Egret	<i>Egretta garzetta</i>	1	1	R	LC	C
24.	Cattle Egret	<i>Bubulcus ibis</i>	1	1	R	LC	C
25.	Grey Heron	<i>Ardea cinerea</i>	1	0	R	LC	C
26.	Indian Pond Heron	<i>Ardeola grayii</i>	1	1	R	LC	C
IV	PHALACROCORACIDAE						
27.	Little Cormorant	<i>Microcarbo niger</i>	1	1	R	LC	C
V	CICONIIDAE						
28.	Asian Openbill	<i>Anastomus oscitans</i>	1	1	R	LC	C
29.	Lesser Adjutant	<i>Leptoptilos javanicus</i>	1	1	R	Vu	C
VI	JACANIDAE						
30.	Pheasant-tailed Jacana	<i>Hydrophasianus chirurgus</i>	1	1	R	LC	C
31.	Bronze-winged Jacana	<i>Metopidius indicus</i>	0	1	R	LC	C
VII	RECURVIROSTRIDAE						
32.	Pied Avocet	<i>Recurvirostra avosetta</i>	1	0	W	LC	U
VIII	PODICIPEDIDAE						
33.	Little Grebe	<i>Tachybaptus ruficollis</i>	1	1	R, L	LC	C
34.	Great Crested Grebe	<i>Podiceps cristatus</i>	1	1	W	LC	U
IX	RALLIDAE						
35.	Common Coot	<i>Fulica atra</i>	1	1	R, W	LC	C
36.	Purple Swamphen	<i>Porphyrio porphyrio</i>	0	1	R	LC	C
X	ALCEDINIDAE						
37.	White-throated Kingfisher	<i>Halcyon smyrnensis</i>	1	1	R	LC	C
38.	Common Kingfisher	<i>Alcedo atthis</i>	1	1	R	LC	C
39.	Pied Kingfisher	<i>Ceryle rudis</i>	1	1	R	LC	C
40.	Ruddy Kingfisher	<i>H. coromanda</i>	1	0	R	LC	U
XI	MOTACILLIDAE						
41.	Western Yellow Wagtail	<i>Motacilla flava</i>	1	1	W	LC	C
42.	White Wagtail	<i>M. alba</i>	1	1	W	LC	C
43.	Citrine Wagtail	<i>M. citreola</i>	1	1	W	LC	C
44.	Grey Wagtail	<i>M. cinerea</i>	1	0	W	LC	C
XII	LARIDAE						
45.	Black-headed Gull	<i>Chroicocephalus ridibundus</i>	1	1	W	LC	C
46.	Whiskered Tern	<i>Chlidonias hybrida</i>	0	1	R, W	LC	C
XIII	HIRUNDINIDAE						
47.	Barn Swallow	<i>Hirundo rustica</i>	1	1	R, W	LC	C
XIV	FALCONIDAE						
50.	Common Kestrel	<i>Falco tinnunculus</i>	1	0	W	LC	C
XV	ACCPITRIDAE						
51.	Pied Harrier	<i>Circus melanoleucos</i>	1	1	M, W	LC	C
52.	Eastern Marsh Harrier	<i>C. spilonotus</i>	1	0	W	LC	U
53.	Osprey	<i>Pandion haliaetus</i>	0	1	R, W	LC	U
XVI	SCOLOPACIDAE						
54.	Jack Snipe	<i>Lymnocyrtus minimus</i>	1	0	W	LC	U
55.	Common Snipe	<i>Gallinago gallinago</i>	1	1	W	LC	C
56.	Marsh Sandpiper	<i>Tringa stagnatilis</i>	1	0	W	LC	C
57.	Green Sandpiper	<i>T. ochropus</i>	1	0	W	LC	C
58.	Wood Sandpiper	<i>T. glareola</i>	1	0	W	LC	C
59.	Common Sandpiper	<i>Actitis hypoleucos</i>	1	1	W	LC	C
60.	Common Green Shank	<i>T. nebularia</i>	1	0	W	LC	C
61.	Little Stint	<i>Calidris minuta</i>	1	0	W, P	LC	C
XVII	ROSTRATULIDAE						
62.	Greater Painted-snipe	<i>Rostratula benghalensis</i>	0	1	R	LC	C

Abbreviations:

1=Recorded; 0=Not recorded

C=Common; En=Endangered; LC=Least Concern; NT=Near Threatened; P=Passage migrant; R=Residential; U=Uncommon; Vu=Vulnerable; W=Winter Migrant

Sighting of Purple-throated-, or Van Hasselt's Sunbird *Leptocoma sperata brasiliana* in Karimganj District, Assam, with notes on its status in India

Vijay Anand Ismavel & Praveen J.

Ismavel, V. A., & Praveen J., 2015. Sighting of Purple-throated-, or Van Hasselt's Sunbird *Leptocoma sperata brasiliana* in Karimganj District, Assam, with notes on its status in India. *Indian BIRDS* 10 (3&4): 104–108.

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The Purple-throated Sunbird *Leptocoma sperata* is a wide-ranging South-east Asian species distributed through the Philippines, the Sunda Islands, the Malaya Peninsula, and Myanmar, reaching the extreme south-eastern parts of South Asia (Cheke & Mann 2008). Regionally occurring, Van Hasselt's Sunbird *L. s. brasiliana* is sometimes regarded as a separate species, distinct from the races found in the Philippines (Rasmussen & Anderton 2012). The species is considered local, or rare, in India, common in eastern Bangladesh (Sylhet), mainly from the month of October till the middle of January (Cheke & Mann 2008). Rasmussen & Anderton (2012) list it as a resident in the lower parts of the hills of southern Assam (north and south Cachar), and eastern Bangladesh (Sylhet, Tippera, and Chittagong).

This article describes the sighting, accompanied by photographs, of one male Van Hasselt's Sunbird from Karimganj District, Assam, in north-eastern India, along with a probable female. Here we also analyse past records of this species and clarify several ambiguities in terms of locations that may or may not fall within present day India.

Observations & Identification

On 15 March 2015, VAI, along with a group of three staff members of the Nature Club of Makunda Christian Hospital, Bazaricherra, Karimganj District, and a few local villagers went into the forests for biodiversity documentation. This involved a trek through thick forest for about 10 kms from the nearest human habitation, Srirampur village, close to Dullabcherra town in Karimganj District, to reach the site of observation (24.39°N, 92.37°E). At about 0830 hrs, several birds were spotted feeding on a large blossom-filled shrub, probably *Symphorema involucreatum*; most of the birds flew away when approached, but two sunbirds continued to feed on the blossoms. One of them had an iridescent green crown; seven photographs were taken of this bird before it flew away [79-84]. Unfortunately, the camera's settings had not been changed (after photographing a moth), and the bird was also very active, consequently most of the photos were not sharp. Since the bird had a metallic green crown, it was assumed that the bird was the locally common Ruby-cheeked Sunbird *Chalcoparia singalensis*. The party then heard calls of the hoolock gibbon *Hoolock hoolock*, and moved quickly to see those endangered primates.



79. Purple-throated Sunbird *L. sperata* showing iridescent green crown of the male.



80. Lateral view of the male Purple-throated Sunbird.



81. Purple-throated Sunbird showing iridescent purple of throat and maroon of upper belly.



82. Dorsal view of black with glossy blue tail of male Purple-throated Sunbird.



83. Top view of head and upper breast of male Purple-throated Sunbird.



84. Olive upper parts, yellow lower parts and faint eye ring of female Purple-throated Sunbird.

Upon returning, VAI processed the images and found that the bird was a Van Hasselt's Sunbird. The bird had the distinctive maroon coloured breast and under parts, iridescent purple coloured throat, apart from a green crown. One sharp image was obtained of the female sunbird. The picture showed a white eye-ring, yellowish throat and under parts, and a short bill; all congruent with a typical female of this species. The photographs were posted to the *Oriental Bird Pix* Google Group and Krys confirmed the identity of the male bird (Krys, *pers. comm.*, email

dated 16 March 2015); the images have since been accepted into the OBI database. It is very likely that the female was also of that species as they were a calling pair.

Discussion

While most references appear to indicate that this species is distributed, at least, over most of present day Tripura, southern Assam, and parts of Manipur, and Mizoram, there appear to

be a paucity of actual records to support those claims. Neither are there any photographs taken from India, nor are there any recent records of this species from the country. Authors seem to have freely quoted each other without realising that some of the territories mentioned by historical workers have been split after Indian independence, and during the reorganisation of Indian states, such that records from the erstwhile regions of "Assam", "Sylhet", and "Tippera", require closer scrutiny before they can be accepted as definite for India.

The political histories of Sylhet- (Bangladesh), which borders Assam (India), and Comilla- Districts (Bangladesh), which borders Tripura (India), are of interest here, along with the history of the Barak Valley of Assam, and the state of Tripura. Whilst India was a colony of the British, post 1857, the territories of Assam province included those of present day Sylhet. Subsequently, following the Partition of Bengal (1905–1911), Assam and East Bengal became a single large province. Following a referendum in July 1947, the erstwhile district of Sylhet became part of erstwhile East Pakistan, except for the Karimganj subdivision, which became a part of the Cachar District of Assam in India. In 1983, Cachar District was trifurcated into Cachar-, Hailakandi-, and Karimganj- Districts.

Tripura became a princely state during British rule in India; its kings had an estate in the plains and an independent area in the hills. Following India's independence in 1947, the plains estate, known as Plains Tippera (or just Tippera or Tipperah), became the Comilla District of Bangladesh. Hill Tippera (or Tipperah) remained under a Regency Council till 1949 when it became the Tripura state of India. Hence, prior to 1905, when most of the specimens were taken, the district of Karimganj was a part of Sylhet, and not Cachar. The entire Sylhet District was a part of Assam, and Comilla District was called Tippera.

About sixteen museum specimens of this species from South Asia were located in the collections of Natural History Museum, London (BMNH), Bombay Natural History Society (BNHS), Cornell University Museum of Vertebrates (CUMV), Field Museum of Natural History (FMNH), Royal Ontario Museum (ROM), University Museum of Zoology, Cambridge (UMZC), and Yale Peabody Museum (YPM) (Table 1). Just four of them are labelled 'India'. The most recent collections from South Asia were by R. A. Paynter, in 1958, from Sylhet, and the Chittagong Hill Tracts in Bangladesh. A. M. Primrose contributed

six specimens from Rema Tea Estate in southern Sylhet (now in Bangladesh). Primrose (1902), who was stationed there, indicated that this species is exceedingly common between October and January. C. M. Inglis contributed the remaining southern Sylhet specimens. Since Sylhet was a part of Assam ante 1905, the FMNH specimen is apparently labelled "Assam, India", while the BMNH specimen also mentions "Assam". These should now be treated as though from Sylhet, Bangladesh. A. O. Hume indicates that the species appears in "the Arracan Hills, Chittagong, and Hill Tipperah, where I have obtained it, and whence many specimens were sent me long ago by the late Mr. Irwin" (Hume & Davison 1878). Hume (1970) indicates having received a single specimen of this species from Irwin who sent specimens of many other species from Tipperah [not Hill Tipperah], and possibly Hume has muddled these two entities and also the total number of specimens he received of this species. BMNH specimen labelled "Commillah (?), Tipperah" in the Hume Collection is possibly the one supplied by Valentine¹. Major H. H. Godwin-Austen, during his surveys in the hills south of the Brahmaputra, which included present day Tripura, did not come across this species but mentions a specimen contributed by Mr. Ross Mangles from Tripura [=Hill Tippera] (Godwin-Austen 1874). This specimen is now in BMNH and *should count as the first for the country* (authors' italics). A specimen exists in the private collection of Frank S. Wright, collected in 1894, and contributed to CUMV in 1939 (CUMV: 14548), which was collected from Cachar (wrongly attributed to Manipur state). Though the other specimen in the same series (#14551) is labelled 'Bangladesh', and the provenance of these specimens is not fully established, Cachar has always been in India, and hence this should count as the only other specimen for the country. Two of the specimens labelled 'India' (UMZC 27/Nec/5/III/1, and YPM ORN 011654), and one labelled 'Assam' (BMNH 1886.12.1.811), lack more precise collection-locality data. However, all specimens are definitely from either late nineteenth- or early twentieth centuries; those that may have been collected from areas that are in present day Bangladesh, cannot be considered valid for India.

Subsequent compilations of Indian ornithology have mostly depended on these nineteenth- and early twentieth century specimens to chalk out the species' range. Oates (1890) has nothing new to say except that Godwin-Austen obtained

Date	Location	Collector/Collection	Code
1846	India	Strickland Collection. Collected by Blyth	UMZC 27/Nec/5/III/1
1869	Commillah (?), Tipperah	Hume Collection. Probably collected by I. Valentine	BMNH 1886.12.1.747
Undated	India	Collected by W. F. Rosenberg	YPM ORN 011654
May 1873	Assam	In Hume Collection. Collected by H. C. Parker.	BMNH 1886.12.1.811
Pre-1874	Hill Tipperah	In Godwin-Austen Collection. Collected by R. Mangles	BMNH 1895.7.14.2606
03 July 1894	Cachar, Manipur, India	In F. S. Wright Collection	CUMV:14548
Undated	Bangladesh	In F. S. Wright Collection	CUMV:14551
08 October 1900	Rema Tea Estate, Bangladesh	Collected by A. M. Primrose	BNHS: 9559
10 October 1900	South Sylhet, Bangladesh	Collected by C. M. Inglis	BNHS: 9657
September 1901	Rema or Kowai, Sylhet, Assam, India	In H. K. Coale Collection. Collected by A. M. Primrose	FMNH:98616
October 1901	Rema Tea Estate, Luckerpore Valley, South Sylhet, Assam	In H. Whistler Collection. Collected by A. M. Primrose	BMNH:1949. Whi.1.5625
12 October 1901	Rema Tea Estate, Bangladesh	Collected by A. M. Primrose	BNHS: 9658
02 September 1902	Rema, Sylhet, Bangladesh	Collected by A. M. Primrose	YPM ORN 043413-14
October 1902	Rema Tea Estate, Luckerpore Valley, South Sylhet, Bangladesh	Collected by A. M. Primrose	ROM:56324
24 February 1958	Rangamati, Chittagong Hill Tracts, Bangladesh	Collected by R. A. Paynter	YPM ORN 088041
29 April, 03 & 07 May 1958	Baramchal, Sylhet, Bangladesh	Collected by R. A. Paynter	YPM ORN 088042-44

¹ Irwin Valentine was then the Collector of Tipperah. He also served as Commissioner of Manipur and is also believed to have introduced polo in the British Isles when he returned in 1865 (Laffaye 2009).

specimens from Tippera, and that Hume recorded it from there, as well as in Chittagong. However, this already diluted two fine details – rather than he himself collecting, Godwin-Austen was supplied a specimen by another collector (see above), and that it came from Hill Tippera [not Tippera]. Baker (1926) lists its range as Assam, Tippera, Chittagong, Manipur, and Mizoram [=Lushai] with an additional comment that it is “very rare in Assam but straggles into Cachar and Sylhet on the south and to Lakhimpur on the north of the Brahmaputra”. It is unclear on what basis Baker claims the record from Lakhimpur, Manipur, and Mizoram as there have been no previous publications or specimens from those areas. Most likely they were his observations, largely unsubstantiated, and generally treated with caution (Rasmussen & Anderton 2012). It is unclear whether Baker was aware of the Cachar specimen, even though he must have been referring to Oates when listing Tippera; Oates himself should have correctly written Hill Tippera. Ali & Ripley (2001) add Dibrugarh, Silchar, and Hailakandi into the Indian range with no further substantiation; however, they rightly give the range in Bangladesh as “south Sylhet, Comilla, Chittagong and down to Cox’s Bazaar”. It appears that Lakhimpur of Baker (1926) is what is referred to as Dibrugarh by Ali & Ripley (2001). Rasmussen & Anderton (2012) repeat Ali & Ripley for the range statement for Bangladesh but explicitly state north and south Cachar, giving an impression that there are multiple established records from Cachar. However, they caution that the “NE Arunachal report needs substantiation”. It is unclear as to which “NE Arunachal report” they are referring to, perhaps the Lakhimpur reference of Baker (1926). It may be noted that Lakhimpur, and Dibrugarh have always been in Assam!

In recent years, forests in Bangladesh, adjoining the Barak Valley, appear to be better worked in terms of ornithology than the hills in southern Assam. The sunbird is listed as a common resident in the evergreen forests of Chittagong- and Sylhet divisions in Bangladesh (Siddiqui *et al.* 2008; Khan & Aziz 2012). As per recent information, it is an uncommon resident in most of the eastern forests in Bangladesh and has been confirmed from 14 forest sites / protected areas in that country. Many of these sites are along the southern to eastern fringes of Greater Sylhet (e.g., Moulvi Bazar District), and largely close to the northern border of Tripura, with the closest location to Assam being Madhabkunda (24.64°N, 92.22°E) on the far east of Moulvi Bazar District. Other sites are in the forests of the Chittagong region, through the hill tracts, to Cox’s Bazar area. (Paul Thompson, in email dated 18 March 2015). An online search in the *Birds Bangladesh* Facebook group provided at least half a dozen clear pictures of males of this species, indicating that it is a fairly widespread species in appropriate habitats of that region, and well-known to bird-watchers.

Contrary to this, there are no records in recent times from Tripura, Mizoram, or Manipur. People who frequent hills south of the Brahmaputra have not seen this species (Shashank Dalvi, *verbally*, March 2015; T.R. Shankar Raman, *in litt.*, email dated 16 March 2015). Choudhury (2005, 2009, 2010) lists this species in the state checklists of Mizoram, Manipur, and Tripura but cites Ali & Ripley (2001) as his source. Males of this species have been recorded three or four times (undated) from the southern part of Hailakandi- and Cachar Districts of southern Assam during 1986–1988 (Anwaruddin Choudhury, *in litt.*, email dated 04 May 2015). It is quite likely that the species is regular in some of the forests in Tripura that are close to the Bangladesh border as this is common in the adjoining tracts in Bangladesh. However,

this shows how little we know of the ornithology of some regions in the hills south of Brahmaputra. In the absence of any verifiable evidence, we propose that this species be deleted from the checklists of Manipur, and Mizoram until fresh evidence is presented. Its distribution range in India should, at best, be limited to Tripura, and Cachar, and that too based on just three verifiable records, including the present one.

While the hotspots in the Eastern Himalayas, and the Brahmaputra Valley are heavily visited by amateurs and professionals, there is hardly any recent systematic avian documentation from the Barak Valley, comprising of the extant districts of Karimganj, Hailakandi, and Cachar. The location of the above observation is also rumoured to be near hideouts of militants, and is therefore not a popular place for birding. Active conservation work is largely unknown in states like Tripura where natural vegetation is fast depleting. The absence of mega-rarities does not help in focusing on the area, but that does not detract from the fact that several species present only in the south-eastern parts of north-eastern India can be found here. VAI has recorded species confined to hills south of the Brahmaputra, like Olive Bulbul *Iole virescens* (http://orientalbirdimages.org/images/data/karimganj_birds139b.jpg), and Stripe-breasted Woodpecker *Dendrocopos atratus* (http://orientalbirdimages.org/search.php?p=11&Bird_ID=239&Bird_Family_ID=&pagesize=1) from different locations in the district. It is possible that Orange-bellied Flowerpecker *Dicaeum trigonostigma* also occurs here. The forests are being actively cleared and it is imperative that the remaining biodiversity be assessed and conservation imperatives identified. Whilst the local tribal community is dependent on forest resources for their livelihoods, there are many non-local immigrants who are involved in the large scale felling of trees, and in the trapping, and poaching of wildlife. If local biodiversity turns popular amongst tourists, it is possible to use the local communities to protect the forests in return for a livelihood through eco-tourism.

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Some important photographic records from Gujarat

Rajni Trivedi

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A total of 536 species of birds were recorded from Gujarat state till 2004 (Parasharya *et al.* 2004). Subsequently I photographed some birds that were additions to the Gujarat list. Some of these have already been published in *Vihang*, a newsletter published in the Gujarati language. I present below photographs of some of these records, which are important for Gujarat ornithology.

Eurasian Bittern *Botaurus stellaris*

The Eurasian Bittern was first recorded, and photographed at Nalsarovar Bird Sanctuary on 07 April 2009 (Sidani 2009b). Again



85. Eurasian Bittern *Botaurus stellaris* photographed on 07 April 2009.

I recorded a single bird on 08 February 2011 at Nalsarovar Bird Sanctuary [85]. These were the first photographs of the species from Gujarat. Grimmett *et al.* (2011) show isolated record(s), with uncertain locations, for Gujarat, whereas Hancock & Kushlan (1984), as well as Rasmussen & Anderton (2012), show it as a winter visitor to the entire Gujarat state. However, there are very few specific past records of the species from Gujarat. Anonymous (1887) mentioned its presence in Gujarat. Ali (1954) did not come across the species during his survey of Kachchh and Gujarat, but mentioned a record of the species by Butler (1877) from near Deesa in northern Gujarat. Dharmakumarsinhji (1955) considered it a winter visitor to Gujarat and Kachchh, but as a rare



86. Little Bittern *Ixobrychus minutus*.

visitor in Saurashtra. It is listed in Parasharya *et al.* (2004), based on historical records. The present record is important, as there are no specific published records with photographs from the state.

Little Bittern *Ixobrychus minutus*

A single adult male Little Bittern was photographed near Kathechi village at Nalsarovar Bird Sanctuary on 15 April 2009 (Anon., 2009; Sidani 2009a) [86]. This is the first record of the species from Gujarat as its distribution for the state has not been shown in recent field guides (Kazmierczak 2000; Grimmett *et al.* 2011; Rasmussen & Anderton 2012), and neither is it included in Parasharya *et al.* (2004). The species is considered to be resident in Kashmir and Baluchistan (Grimmett *et al.* 2011), or northern India (Hancock & Kushlan 1984). Its status in Gujarat is still unclear, and can be ascertained only after further sightings.

Indian Blue Robin *Larvivora brunnea*

A male Indian Blue Robin was photographed [87] at Manmodi village, 15 km south of Ahwa town (20.759°N, 73.687°E) in Dang District on 29 March 2007. Earlier, there was only a single record of the species from Hingolghadh, Gujarat (Naik *et al.* 1990; Khacher 1996). Recently, the species was also recorded from Mandavi, Surat District in March 2011 (Bhojwala 2011), Madhavpur (21.254°N, 69.967°E), Porbandar District on 22 November 2012 (Trupti Vyas, *pers. com.*), and Girnar forest on 27 March 2013 (Ashok Mashru, *pers. com.*). Thus it could be a vagrant or a rare passage/winter migrant in Gujarat.

Tickell's Thrush *Turdus unicolor*

A photograph of a Tickell's Thrush was taken on 23 December 2010 [88], on a hilltop, near a small village of Ratanmahal Wildlife Sanctuary. The bird was photographed on a banyan tree (Trivedi 2012). There were five birds around with one juvenile. I could



87. Indian Blue Robin *Larvivora brunnea*.



Photos: R. Trivedi

88. Tickell's Thrush *Turdus unicolor*.

identify the bird in the photograph only after I read Deomurari's (2012) note. Arpit Deomurari (*pers. com.*) again saw it at the same place on 03 January 2013. Three records from the same area during last four years indicate that it may be a regular winter visitor to the area.

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A Yellow-browed Tit *Sylviparus modestus* nest from Kedarnath Wildlife Sanctuary, Uttarakhand, India

Sahas Barve & André A. Dhondt

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Temperate species of the family Paridae are some of the best studied wild birds in the world (Lambrechts *et al.* 2010), yet tropical species and sub-species of this family remain understudied (Gosler & Clement 2007). We report here the description of a nest of the Yellow-browed Tit *Sylviparus modestus* from the Kedarnath Wildlife Sanctuary in Uttarakhand, India.

The Yellow-browed Tit is a basal species in the parid clade (Gill *et al.* 2005). Knowledge of its ecology is hence crucial in understanding the evolution of traits in this geographically widespread family. It is a fairly common bird of the oak (*Quercus* species) forests of the Himalayas. Here, it is known to occur between 1950 m and 3600 m (Gosler & Clement 2007). In the Kedarnath region, it is most commonly seen between 2300 m and 3300 m in the breeding season but winters down to 1600 m (Sahas Barve, *pers. obs.*). It is easily overlooked as its coloration and size resemble the abundant and speciose *Phylloscopus* warblers and it is a difficult species to observe in the mixed-species flocks that it often participates in. Although described in 1836, the first two cavity nests of this species were not described until 1973 (Fleming Jr. 1974). In the 41 years since

then, only one other nest has been described by Löhrl in 1981 (Löhrl 1981, Martens & Eck 1995). All three nests were from central Nepal and from the Phulchowki region, with the highest nest at 2378 m (Fleming Jr. 1974). We describe here a nest of this species, the fourth published description till date, and the first from the Indian Himalayas, c. 1000 km north-west of the previous nest observations.

We found the nest at 3025 m in *Quercus semicarpifolia*–*Rhododendron arboreum* dominated sub-alpine forests of the Kedarnath Wildlife Sanctuary (30.478886°N, 79.215325°E) on 30 May 2013 at around 0730 hrs. It was located in a cavity, about 6 m above the ground, in a *R. arboreum* tree. The cavity had a circular entrance, about 30 mm in diameter and appeared to be one made by another bird, probably a woodpecker. Since no woodpecker of that size is found in the area, it might have been a cavity that was abandoned by its excavator.

We observed the adult(s) entering and leaving the nest. As observed by Löhrl (1981), the adult flew directly into the nest through the opening. Only a single prey item was brought to the nest on every visit. The prey items were difficult to identify but

did include small hair-less caterpillars. The consistent small size of the prey suggested that the chicks were very small. We did not attempt to investigate the number of chicks or the size of the cavity, as the nest was inaccessible.

This is, to the best of our knowledge, the western-most nesting record, and the highest elevational nest reported for this species. The nest we describe here, and those described by Fleming Jr., and Löhrl, suggest that this species is a secondary cavity nester, adopting either natural cavities, or those made by other birds; an ancestral trait in tits (Dhondt 2007).

The species shows a large variation in the height at which the nest is placed (0.5–7 m) but is partial to small entrances to the nest, sometimes merely a split in the tree. However, other aspects of its breeding biology, like the number of eggs per clutch, colour and size of the eggs, incubation period, nestling period, and behaviour of adults during nesting remains poorly known. We had many observations of the Yellow-browed Tit joining mixed-species foraging flocks in May. Mixed-species foraging flocks often form in the non-breeding seasons, when birds are not territorial, and there is a shortage of food resources making each individual range over a large area (Graves & Gotelli 1993). Presence of Yellow-browed Tits in mixed-species flocks in the breeding season was thus an interesting behavior.

Montane habitats in the Himalayas contain many species like the Yellow-browed Tit, the natural history of which is poorly understood. Knowledge of the ecology of these species is however essential for conservation of these threatened habitats.

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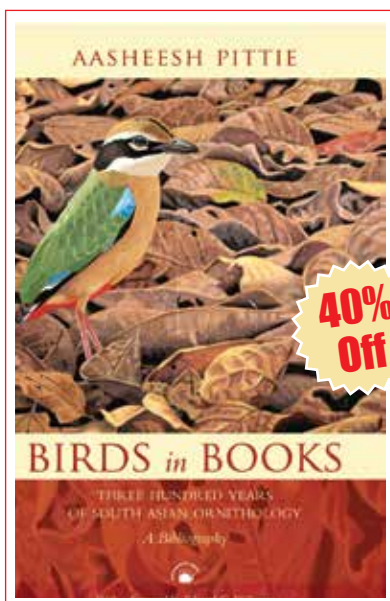
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- Edward Dickinson, editor of *The Howard and Moore Complete Checklist of the Birds of the World* (2005)



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Snapshot sightings

Siberian Rubythroat from Lucknow, Uttar Pradesh

Rushil Fernandes & Able Lawrence



A male Siberian Rubythroat *Calliope calliope* was photographed on 08 March 2015 and again on 28 & 29 March 2015 at the campus of Sanjay Gandhi Postgraduate Institute of Medical Sciences (SGPGIMS) (26.75°N, 80.93°E), Lucknow, Uttar Pradesh. The bird was found in lantana bushes at the intersection of two footpaths

in the middle of a forest patch dominated by *Prosopis juliflora*. This is the first photograph of this species from the state of Uttar Pradesh. Eight specimens (AMNH 462859-64, FMNH #239121-22) collected by Walter Koelz from the villages of Kalnahi and Nichlaur in Maharajanj district in February 1947 (<http://portal.vertnet.org/>) are the only prior occurrence reports for the state. It is unclear if the bird spent the winter or was on return passage.

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Long-tailed Skua from Walayar, Kerala

M Krishna Moorthy



On 9 May 2015, a breeding adult Long-tailed Skua *Stercorarius longicaudus* was photographed from Walayar dam (10.84°N, 76.85°E) in Kerala-Tamil Nadu border. This site is roughly 90km from the

nearest sea coast and the bird was found to be flying without any signs of fatigue. Records of Long-tailed Skuas from the country are few (Ukil & Karuthedathu 2014, Karuthedathu 2014), an inland record even more interesting while this is only the second record from Kerala after Bhat (2015).

Marnadan House, Naduthara. Nallepilly P.O, Palakkad, Kerala. 678553. Email: shnathy@gmail.com

Jouanin's Petrel from Loktak, Manipur

Elangbam Premjit Singh

A tubenose was recovered near the kitchen of a house in Toubul (24.62°N, 93.79°E) near Loktak Lake, Manipur on 29 June 2015. Identification from photographs was difficult, however all dark thick beak, long wedge-shaped tail together with its size confirmed it as a Jouanin's Petrel *Bulweria fallax*. The bird succumbed to fatigue the next day. There are less than ten confirmed records



of this species from India and it has been recorded from the east coast only once from Sundarbans (Praveen *et al.* 2013). This is probably the first instance of Jouanin's Petrel occurring deep inland (300km from nearest sea coast) as windblown or otherwise.

Toubul, Bishnupur District-795126, Manipur E-mail: premjitanao@gmail.com

Altai Accentor near Sela Pass, Arunachal Pradesh

Bikash Kalita



On 22 January 2015, while returning back from Sela pass to Dirang in western Arunachal Pradesh, a flock of 5-6 small birds were witnessed from the moving vehicle near Baishakhi camp (27.45°N, 92.10°E). Habitat was rocky hill side with little grass around but near to a habitation. On a closer look, they were identified as Altai Accentors *Prunella himalayana*.

Mainly a West Himalayan species (Rasmussen & Anderton 2012), there has been no photographs till date from Arunachal Pradesh though it has been listed (Ali & Ripley 1983, Choudhury 2006, Rasmussen & Anderton 2012) and mapped from one location (Grimmett *et al.* 2011) for the state possibly all inherited from the reference to Miri Hills in Baker (1924).

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