Population trend of the common birds in a residential area of Thiruvananthapuram city, Kerala

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Raju S., 2015. Population trend of the common birds in a residential area of Thiruvananthapuram city, Kerala. *Indian BIRDS* 10 (2): 40–45.
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Manuscript received on 22 August 2013.

Abstract

The status and distribution of birds in Jawahar Nagar, a residential area in Thiruvananthapuram, Kerala were studied from March 2005 to March 2010. Bird diversity, and abundance, were assessed through systematic, regular, and repeated surveys. Seventy-seven species of birds were identified during the study period, represented 34 families, of which one is categorised as Near Threatened, four are in Schedule I of the Wildlife Act, 14 are migrants, 62 residents, and two, habitat specialists. 213 field hours were spent in the field. House Sparrows *Passer domesticus,* which were abundant during the 1990s, were totally absent during the study period. An analysis of the data showed a gradual increase in the diversity, and abundance, of birds in the initial years, followed by a decrease in the last year. Incidentally, the study area was under a lot of disturbance during the study, caused by construction activity, habitat destruction, *etc.* An increase in the numbers of some species, especially Rock Pigeon *Columba livia,* was noticed, along with the increased number of large apartment blocks in the area. 40 species of birds were recorded breeding in the area, using 31 trees of different species; more than ten other nesting sites were observed. . One large roost was also observed, with 10,000+ birds comprising nine species. The guild structure analysis of the birds showed an equal representation of insectivores and carnivores (20 species each). As birds are indicators of the health and quality of their environment, fixing priorities, and developing strategies, for their conservation is inevitable for a healthy urban agglomeration.

Introduction

Birds are amongst the most visible forms of Earth's biodiversity. They are good indicators of environmental change. They occupy a range of habitats, and are responsive and sensitive to environmental change. Public planners can use the changes in their populations in a habitat, for strategic conservation planning for the wider environment. Birds are excellent barometers of the health of the environment, and of the sustainability of human activities (Bibby 1999; Niemi *et al.* 1997). Urban habitats are continuously exposed to alterations, unpredictable anthropogenic disturbances, and other developmental activities. Effects of these disturbances are reflected in urban bird populations. This paper presents the population trends of urban birds from an urban, residential area in Thiruvananthapuram, Kerala.

Study area

The study was carried out in Jawahar Nagar (N 8.56 E 76.97), a residential colony located in the heart of Thiruvananthapuram, the capital of Kerala, India. It is one of the oldest residential areas of the city near the Raj Bhavan, the residence of the Governor of Kerala. The elderly residents of this colony recall that the area was a well-wooded hillock during the 1950s, had many fresh water ponds, and vast lush green paddy fields on its eastern side. The Tapioca Research Station under the Kerala Agricultural University functioned here during that time, and the area was known as '*Maracheenivila*' (=the locality of tapioca). After the formation of the State of Kerala in 1956, the area was converted to residential plots, paving the way for hundreds of buildings, bungalows, and dwelling quarters for government officials. The thickets and patches of groves were cleared off, and the ponds and marshes filled up. Instead of the old indigenous trees, new exotic tree species and garden plants were introduced. By 1970 the area had been totally transformed into a residential area. The real estate boom, which reached its peak during the study period, changed the landscape of Jawahar Nagar. More than 200 new buildings and 11 large apartment complexes rose during the study period, and destroyed the remaining trees, open lands, and marshy areas.

Methodology

The study tried to understand the status, and distribution, of the common bird population of this urban locality. The birds of the residential colony were regularly monitored for a period of five years, from March 2005 to March 2010. A 1.4 km transect was selected along the main road passing through the center of the residential colony. This was traversed in one hour, in the morning, between 0630–0930 hrs. All the birds that were either seen, or heard, on either side of the road, were recorded. Surveys were carried out once every week, in the first four years, and once a month, during the last year. Birds that were observed incidentally in the area, outside the study time, also were noted, and added to the species list. Biological activities of birds, like feeding, displays, nesting *etc.*, were recorded whenever I happened to observe them.

Results and discussions

I observed 77 species during the study period, out of which 67 were observed while walking transects. A total of 213 field hours were spent on transect walks in these five years. The average count of birds observed per transect was 153.6, while the average number of species was 23.7. The minimum number of species observed in a survey was 18, the maximum, 36. Species diversity was greater in winter. The maximum count of birds was 251, and the minimum, 87. The total number of species per year increased till the third year, after which it decreased (Fig. 1). In the last year the number of species was only 45. But this year surveys were done once in a month.

Fig. 1. Total number of species

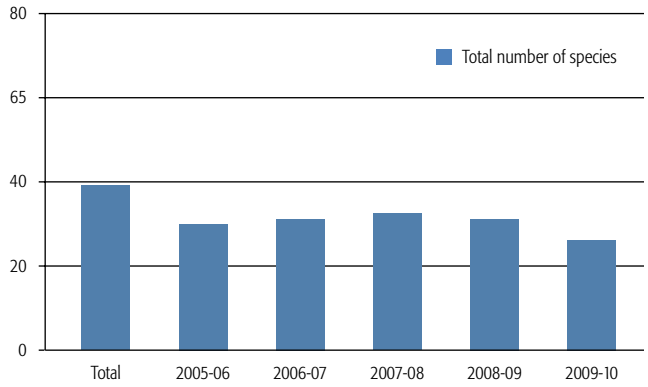
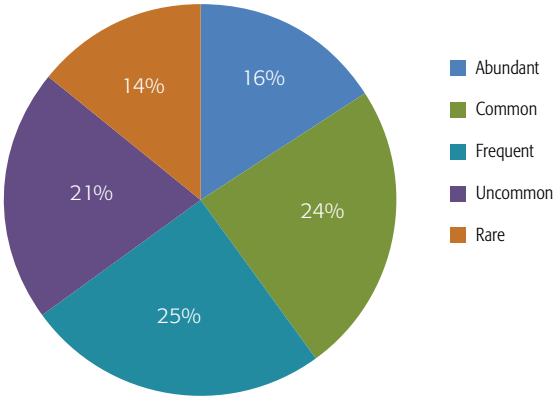


Fig. 2. Abundance



Encounter rate

The encounter rate[1] of the 67 species per ten hours was calculated, and birds were classified into different ordinal scales to assess abundance (Table 1, Fig. 2).

Table 1. Ordinal scales of abundance

Ordinal scale	Category	No. of species
>60	Abundant	11
6--60	Common	16
0.4-6	Frequent	17
0.1-0.4	Uncommon	14
<0.1	Rare	9

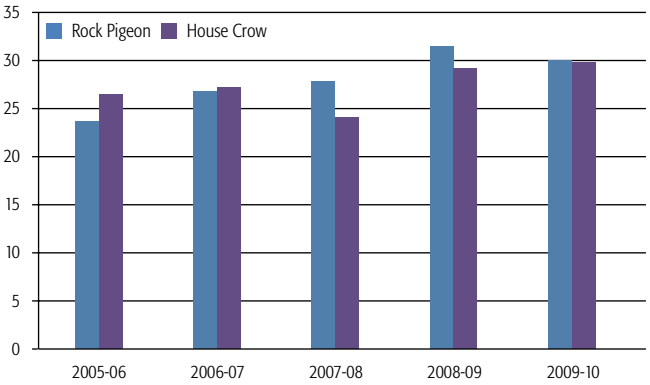
Eleven species of birds were found to be abundant; they were present on almost every day of the survey. These species are listed here in a descending order of abundance. Rock Pigeon *Columba livia*, House Crow *Corvus splendens,* Common Myna *Acridotheres tristis*, Asian Koel *Eudynamys scolopaceus*, Black Kite *Milvus migrans*, Common Tailorbird *Orthotomus sutorius*, Large-billed Crow *C. macrorhynchos*, Purple-rumped Sunbird *Leptocoma zeylonica*, Rose-ringed Parakeet *Psittacula krameri*, Pale-billed Flowerpecker *Dicaeum erythrorhynchos*, and White-cheeked Barbet *Psilopogon viridis*. The Rock Pigeon (ER=283.62) was the most abundant bird, followed by the House Crow (ER=276.24). In the first two years, House Crows were the most abundant birds, but from the third year onwards, Rock Doves' numbers overtook them (Fig. 3). Incidentally, this was the period when the study area suffered increased levels of construction activities, in the form of huge buildings, and apartment blocks. Rock Pigeons exploited new nesting spaces; atop air conditioners projecting outside the buildings, inside air holes, and ventilators, of these huge buildings, *etc*.

Eight birds were found to be 'rare' by the survey. These were Ashy Woodswallow *Artamus fuscus*, Asian Openbill *Anastomus oscitans*, Bronze-winged Jacana *Metopidius indicus*, Brown Hawk Owl *Ninox scutulata*, Indian Roller *Coracias benghalensis*, Cinnamon Bittern *Ixobrychus cinnamomeus*, Oriental Honey Buzzard *Pernis ptilorhynchus*, Plum-headed Parakeet *P. cyanocephala*, and Rosy Starling *Pastor roseus*.

16 species were found to be' common', 17 were under the 'frequent' category, and 14 belonged to the 'uncommon' category. The Yellow-legged Green Pigeon *Treron phoenicopterus* was sighted from the study area, though outside it, and has been listed under the 'uncommon' category.

[1] Encounter Rate (ER) = Total count /Total No. Of Field hours spent x 10

Fig. 3. Average numbers: House Crows vs. Rock Pigeons



Migratory status

Twenty-one species of birds observed from the area were migrants (Table 9), out of which fourteen observed during the study period.

An interesting observation was that the migrants—Greenish Leaf Warbler *Seicercus trochiloides,* Forest Wagtail *Dendronanthus indicus*, Cattle Egret *Bubulcus ibis*, and Indian Golden Oriole *Oriolus kundoo*—were all in the 'common' category (encounter rate between 6–60). Greenish Warblers, and Forest Wagtails are the earliest migrants to Jawahar Nagar. Both of them, along with the Indian Golden Oriole, retained a consistent population in the area, during the study period, spending almost seven months in the study area. They also maintained a remarkable consistency in the timings of their arrivals in winter, and their return journeys (Table 2).

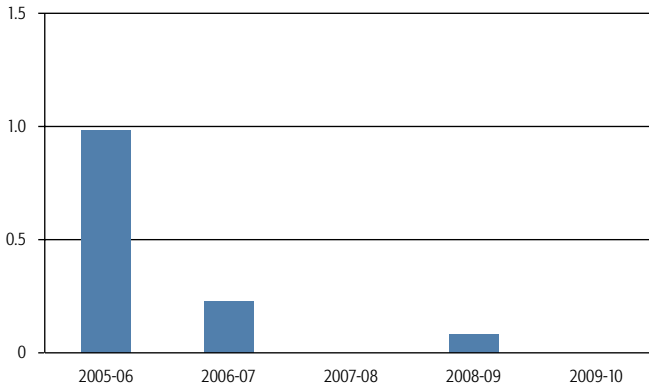
Decline in the population of White-breasted Waterhen

The White-breasted Waterhen *Amaurornis phoenicurus* is a common species of wetlands and marshes. It belongs to the guild category 'Carnivore Aquatic'. I recorded a decline in its population during my study (Fig. 4). The species was totally absent in the last year. The reason for its decline, and absence, in the last year, maybe due to the loss of its habitats—wetlands, marshes, and open lands.

Table 2. Arrival and departure dates of three species of migrants

Year	Greenish Warbler		Forest Wagtail		Indian Golden Oriole	
	Last sighting: summer	First sighting: winter	Last sighting: summer	First sighting: winter	Last sighting: summer	First sighting: winter
2005	30 April	14 October	03 April	14 October	20 April	24 November
2006	07 April	26 September	28 March	27 October	07 April	16 November
2007	04 April	16 October	28 March	23 October	04 April	05 November
2008	07 April	30 October	07 April	01 October	15 April	15 November
2009	06 April	30 October	06 April	26 September	06 April	30 October

Fig. 4. Average number of White-breasted Waterhen per day



Breeding records

Breeding activities of 40 species were recorded from the study area. These included observations of nests, nest building, birds with nesting material, birds feeding chicks, sightings of chicks, juveniles, immatures, and sub adults, courtship displays, breeding songs, *etc*. 620 nests, of 33 species, were noted, upon 31 species of trees, and shrubs, included exotic (14), as well as indigenous (17) species (Table 3). 142 species of trees and shrubs were identified from the residential area through a separate survey.

Coconut palms were the most favoured nesting tree; they were used by 13 species of birds, which constructed 213 nests on them. Spathodea was the next most favoured nesting tree (135 nests belonging to eight species). Birds used several artificial nesting sites, including sodium vapour lamps, lamp shades of street lights, ventilation holes and ventilators of buildings, tops of the air conditioner boxes, telephone and electric posts, drainage pipes, mud walls of old houses, crevices between roof tiles, mud pots, hanging ropes, etc. Oriental Magpie Robin *Copsychus saularis*, a hole nester, used several of these artificial nesting sites. This is an example of successful adaptation of a bird to an urban environment. A list of the breeding birds, their nesting months, and the nesting stratum used, are given in the Table 4.

Table 3. List of trees, plants, and shrubs used by birds for nesting

Coconut Palm *Cocos nucifera*	Divi-divi tree *Caesalpinia coriaria*
Spathodea *Spathodea campanulata*	Bauhinia *Bauhinia acuminata*
Gulmohar *Delonix regia*	Tamarind Tree *Tamarindus indica*
Kassoda Tree (Manja Konna) *Cassia siamea*	Kilimaram *Commiphora caudata*
Jackfruit Tree *Artocarpus heterophyllus*	Amla *Emblica officinalis*
Mango Tree *Mangifera indica*	Rain tree *Samanea saman*
Aini Tree *Artocarpus hirsutus*	Bird Cherry *Prunus padus*
Indian Banyan Tree *Ficus benghalensis*	Kasi (Mulluvenga) *Bridelia retusa*
Arecanut Palm *Areca catechu*	Neem tree *Azhadirachta indica*
Nutmeg Tree *Myristica fragrans*	Ixora *Ixora coccinea*
Banana (Plantain) *Musa* sp.	Poomaruthu *Lagerstroemia reginae*
Garlic climber *Adenocalymma alliaceum*	Palmyrah palm *Borassus flabellifer*
Teak *Tectona grandis*	Ornamental palm *Arecaceae* sp.
Hibiscus (red and white) *Hibiscus rosa-sinensis*	Croton plant *Euphorbiaceae* sp.
Bougainvillea (paper plant) *Bougainvillea glabra*	Unknown grass *Gramineae* sp.
	Unknown wild plant

The maximum numbers of nests recorded during the study period were those of the Rock Pigeon (296), followed by the House Crow (120). Table 5 shows the number of nests, in each month, made by Rock Pigeons, and House Crows.

The peak breeding seasons for both the species were March and April. No active nests of Rock Pigeon were observed in June and July. Similarly, I couldn't find any House Crow nest in November. White-cheeked Barbet, Common Myna, Red-whiskered Bulbul *Pycnonotus jocosus*, and Large-billed Crow were the next most frequent breeding species. Their breeding periods were from September to April every year. House Crows constructed nests in eight different species of trees, Large-billed Crows in five, and Red-whiskered Bulbul in five different trees, and shrubs.

It was noticed that the number of trees used for nesting, and the number of nests constructed each year were decreasing over the years (Table 6). The number of trees used for nesting decreased from 19 to nine, and the number of nests from 144 to 98. Seven trees out of the 19 were cut down.

A large roosting site with more than 10,000 birds, belonging to nine species, was observed in the study area. The species were House Crow, Large-billed Crow, Common Myna, Rufous Treepie *Dendrocitta vagabunda*, White-cheeked Barbet, Red-whiskered Bulbul, Indian Pond Heron *Ardeola grayii*, Eastern Cattle Egret, and Little Egret *Egretta garzetta*. The main roosting trees here were the Kassoda tree *Cassia siamea* (8), and the Rain tree *Samanea saman* (4).

A comparison of bird life of Jawahar Nagar in 1996–2004 and 2005–2010

Though regular surveys were done only from 2005, observations on the birds of Jawahar Nagar were done from 1996 onwards. Comparing the observations from 1996 to 2004, with those from the study period, gives interesting data related to the habitat loss and decline in bird population. A total of 104 species, representing 44 families and subfamilies, were observed from the study area in 1996–2004. Checklists of birds observed in the study area during the regular survey period, and the total checklist of birds since 1996 are given in the Table 9. 27 species of birds, representing ten families, were totally missing during 2005–

Table 4. Nesting periods of birds and plants preferred for nesting

Species	Months of nesting records	Nesting trees, and other nesting sites
Shikra *Accipiter badius*	December, February, April	Coconut palm, Aini tree
Black Kite *Milvus migrans*	October, January, February, April	Coconut palm, Aini tree, Tamarind tree
Brahminy Kite *Haliastur indus*	December, March	Coconut palm
White-breasted Waterhen *Amaurornis phoenicurus*	August, January, February	Arecanut palm, Vegetation near a stream
Rock Pigeon *Columba livia*	All months except June and July	Sunshades, air holes and top of a/c boxes in buildings and flats
Rose-ringed Parakeet *Psittacula krameri*	December, January, March, April	Coconut palm, Spathodea, Kassoda tree.
Greater Coucal *Centropus sinensis*	April, May	Mango tree, Nutmeg tree
Jungle Owlet *Glaucidium radiatum*	April, May	Coconut palm, Spathodea tree
Spotted Owlet *Athene brama*	April	Coconut palm, Spathodea tree
Asian Palm Swift *Cypsiurus balasiensis*	April	Palmyra Palm
Indian Roller *Coracias benghalensis*	January, March	Telephone post, Coconut palm
White-throated Kingfisher *Halcyon smyrnensis*	July	Side wall of well
White-cheeked Barbet *Psilopogon viridis*	September to March	Coconut, Spathodia, Mango, Kasssoda
Coppersmith Barbet *P. haemacephalus*	February, April	Coconut, Spathodia
Lesser Golden-backed Woodpecker *Dinopium benghalense*	December, January, February, April	Coconut
Black-hooded Oriole *Oriolus xanthornus*	October, November	Jackfruit tree, Poomaruthu
Black Drongo *Dicrurus macrocercus*	March	Jackfruit tree
Rufous Treepie *Dendrocitta vagabunda*	March, April	Tamarind tree, Jackfruit tree, Amla tree, Rain tree
House Crow *Corvus splendens*	All months except November	Coconut palm, Spathodea, Indian Banyan tree, Kassoda tree (Manja Konna), Jackfruit tree, Mango tree, Aini tree, Gulmohar
Large-billed Crow *C. macrorhynchos*	September to March	Coconut palm, Spathodea, Kassoda tree, Indian Banyan tree, Rain tree
Red-whiskered Bulbul *Pycnonotus jocosus*	December, January, June	Ornamental Palm, Croton plant, Hibiscus, Ixora, Kilimaram
Common Tailorbird *Orthotomus sutorius*	December, January, March, April	Teak, Bauhinia, Parakam (a wild plant), Garlic climber
Yellow-billed Babbler *Turdoides affinis*	September to March	Coconut, Spathodia, Mango, Kasssoda
Jungle Myna *Acridotheres fuscus*	December, January, February,	Coconut palm, Sodium vapour lamp
Common Myna *A. tristis*	September to March	Arecanut palm, Coconut palm, Spathodea, Lamp shade, Telephone post, Sodium vapour lamp
Oriental Magpie Robin *Copsychus saularis*	February, March, April	Teak, Mud wall, lamp shades, sodium vapour lamp, telephone post, Electric posts, air holes, space between the tiles of roofs, drainage pipes, mud pots
Pale-billed Flowerpecker *Dicaeum erythrorhynchos*	December, January, April	Mango tree, Bird cherry
Purple-rumped Sunbird *Leptocoma zeylonica*	December, January, April	Hibiscus, Bougainvillea
Purple Sunbird *Cinnyris asiaticus*	September, November, April	Hibiscus
Loten's Sunbird *C. lotenius*	January, April	Hanging ropes and abandoned wires, Hibiscus
White-rumped Munia *Lonchura striata*	November, January, February	Dividivi, Croton plant, Bauhinia, Neem tree
Scaly-breasted Munia *L. punctulata*	March	Lampshade of a streetlight.
White-browed Wagtail *Motacilla maderaspatensis*	June	Side wall of a Water Tank

Table 5. Number of House Crow and Rock Pigeon nests constructed per month

Year	March		April		May		June		July		August		September		October		November		December		January		February	
	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C
2005–2006	10	6	11	7	4	2	–	1	–	–	–	–	2	–	5	2	4	–	5	3	4	5	6	6
2006–2007	8	5	13	5	5	1	–	–	–	–	2	2	2	1	6	–	–	–	9	4	5	3	7	7
2007–2008	10	4	9	8	8	2	–	–	–	–	5	–	4	2	–	1	6	–	7		4	1	9	9
2008–2009	8	7	11	5	7	1	–	2	–	–		–	9	1	–	2	–	–	6	2	7	4	7	7
2009–2010	15	5	21	4	7	1	–	–	–	1	3	–	–	1	–	–	4	–	5	2	5		11	11
Total	51	27	65	29	31	7	–	3	–	1	10	2	17	5	11	5	14	–	32	11	25	13	40	40

Note: C=House Crow; D=Rock Pigeon

Table 6.

Year	Number of trees used for nesting	Number of nests
2005–2006	19	144
2006–2007	17	136
2007–2008	12	125
2008–2009	10	117
2009–2010	9	98

Table 7. Species categories

	1996–2004	2005–2010
Total bird species	104	77
Waterbirds	21	14
Migrants	18	15
Residents	86	62
Specialist birds	4	2
Generalists	100	75
Schedule I species	7	4
Threatened species	2	1

Table 8. Guilds and species

Feeding Guild Category [Period]	Number of species 1996–2004	2005–2010
Insectivore	35	20
Carnivore	27	20
Frugivore	16	17
Omnivore	9	7
Granivore	7	4
Picivore	5	4
Nectarivore	3	3
Scavenger	2	2

2010. Most of these latter were woodland birds (16 species), and waterbirds (seven species). The decline of these bird species from the area is a clear sign of habitat degradation, with the loss of trees, marshes, and ponds. The House Sparrow, which was very common during 1996–2000, was absent during the survey period. The period from 1996 to 2004 witnessed a gradual decline in the House Sparrow population, and by 2005 the bird became locally extinct. Black-headed Munia *Lonchura malacca*, and Bronzed Drongo *Dicrurus aeneus* also disappeared from the locality. Black-headed Ibis *Threskiornis melanocephalus*, which was the only Near-threatened species in the list, was absent during 2005–2010. Indian Swiftlet *Aerodramus unicolor*, Booted Eagle *Hieraaetus pennatus*, and Crested Serpent Eagle *Spilornis cheela*, all under the Scheduled 1 category of Wildlife Protection Act, 1972, also disappeared. On the other hand, Blyth's Reed-Warbler *Acrocephalus dumetorum*, Rosy Starling, and Forest Wagtail (all migrants) were the species observed only in 2005–2010 period.

The numbers of species observed during the two periods, categorised under different groups, are given in the Table 7.

Guild structure

Feeding guilds of all the species were classified into eight main categories based on their food habits, habitat association, habitat selection, resource use, niche requirements, foraging methods, and behaviour. When the two data sets on feeding guild, from the two periods, were compared, there were considerable differences in the number of species, especially in insectivore, and carnivore guilds. Insectivores were lower in diversity; 20 in 2005–2010 compared to 37 in 1996. And carnivores stood at 20, compared to 27. Some of the canopy foliage feeding birds, and insectivore under storey birds disappeared from the area during this period. Since the guild classification is based on the above-mentioned factors, changes in the habitat have a direct influence on the population decline. Guild classification and the difference in number of species in each guild in the two periods are given in the Table 8.

Conclusion

The presence of 77 species of birds in a crowded residential area, located in the heart of the city, reveals the relevance of such areas, now being continuously subjected to developmental and anthropogenic interventions. The population trends during the study period, of certain species of birds, showed alarming decline. Parks in residential areas act as lungs in an urban ecosystem. They control the microclimate of the region, and help purify the environment. Such areas in the cities are the remaining pockets that birds utilize for feeding, nesting, and roosting. To preserve the biodiversity of such places, it is of utmost importance to retain appropriate habitats. This should be an important component of town planning, and urban development policies. In order to

Table 9. Checklists of birds of Jawahar Nagar

Species recorded	1996–2004	2005–2010	Migrants
Lesser Whistling Duck *Dendrocygna javanica*	X		
Little Grebe *Tachybaptus ruficollis*	X		
Asian Openbill *Anastomus oscitans*	X	X	
Black-headed Ibis *Threskiornis melanocephalus*	X		
Cinnamon Bittern *Ixobrychus cinnamomeus*	X	X	
Black-crowned Night Heron *Nycticorax nycticorax*	X	X	
Indian Pond Heron *Ardeola grayii*	X	X	
Cattle Egret *Bubulcus ibis*	X	X	M
Intermediate Egret *Ardea intermedia*	X	X	
Little Egret *Egretta garzetta*	X	X	
Little Cormorant *Microcarbo niger*	X	X	
Indian Cormorant *Phalacrocorax fuscicollis*	X		
Oriental Darter *Anhinga melanogaster*	X	X	
Oriental Honey Buzzard *Pernis ptilorhynchus*	X	X	
Crested Serpent Eagle *Spilornis cheela*	X		
Booted Eagle *Hieraaetus pennatus*	X		M
Shikra *Accipiter badius*	X	X	
Black Kite *Milvus migrans*	X	X	
Brahminy Kite *Haliastur indus*	X	X	
White-breasted Waterhen *Amaurornis phoenicurus*	X	X	
Red-wattled Lapwing *Vanellus indicus*	X		
Bronze-winged Jacana *Metopidius indicus*	X	X	
Common Sandpiper *Actitis hypoleucos*	X		M
Rock Pigeon *Columba livia*	X	X	
Spotted Dove *Spilopelia chinensis*	X	X	
Emerald Dove *Chalcophaps indica*	X	X	
Yellow-legged Green Pigeon *Treron phoenicopterus*	X	X	
Vernal Hanging Parrot *Loriculus vernalis*	X	X	
Rose-ringed Parakeet *Psittacula krameri*	X	X	

Table 9. Checklists of Birds of Jawahar Nagar

Species recorded	1996–2004	2005–2010	Migrants
Plum-headed Parakeet *P. cyanocephala*	X	X	
Greater Coucal *Centropus sinensis*	X	X	
Asian Koel *Eudynamys scolopaceus*	X	X	
Common Hawk Cuckoo *Hierococcyx varius*	X		
Common Barn Owl *Tyto alba*	X	X	
Collared Scops Owl *Otus bakkamoena*	X	X	
Mottled Wood Owl *Strix ocellata*	X		
Jungle Owlet *Glaucidium radiatum*	X	X	
Spotted Owlet *Athene brama*	X	X	
Brown Hawk Owl *Ninox scutulata*	X	X	
Indian Swiftlet *Aerodramus unicolor*	X		
Asian Palm Swift *Cypsiurus balasiensis*	X	X	
Alpine Swift *Tachymarptis melba*	X	X	M
Indian House Swift *Apus affinis*	X	X	
Indian Roller *Coracias benghalensis*	X	X	
Stork-billed Kingfisher *Pelargopsis capensis*	X	X	
White-throated Kingfisher *Halcyon smyrnensis*	X	X	
Common Kingfisher *Alcedo atthis*	X	X	
Green Bee-eater *Merops orientalis*	X	X	
Blue-tailed Bee-eater *M. philippinus*	X	X	M
White-cheeked Barbet *Psilopogon viridis*	X	X	
Coppersmith Barbet *P. haemacephalus*	X	X	
Common Golden-backed Woodpecker *Dinopium javanense*	X		
Lesser Golden-backed Woodpecker *D. benghalense*	X	X	
Indian Pitta *Pitta brachyura*	X		M
Common Woodshrike *Tephrodornis pondicerianus*	X		
Ashy Woodswallow *Artamus fuscus*	X	X	
Common Iora *Aegithina tiphia*	X		
Large Cuckooshrike *Coracina javensis*	X		
Black-headed Cuckooshrike *Lalage melanoptera*	X		
Brown Shrike *Lanius cristatus*	X		M
Indian Golden Oriole *Oriolus kundoo*	X	X	M
Black-naped Oriole *O. chinensis*	X	X	M
Black-hooded Oriole *O. xanthornus*	X	X	
Black Drongo *Dicrurus macrocercus*	X	X	
Ashy Drongo *D. leucophaeus*	X	X	M
Bronzed Drongo *D. aeneus*	X		
Greater Racket-tailed Drongo *D. paradiseus*	X	X	
Indian Paradise-flycatcher *Terpsiphone paradisi*	X	X	M
Rufous Treepie *Dendrocitta vagabunda*	X	X	
House Crow *Corvus splendens*	X	X	
Large-billed Crow *C. macrorhynchos*	X	X	
Red-whiskered Bulbul *Pycnonotus jocosus*	X	X	
Red-vented Bulbul *Pycnonotus cafer*	X		

Table 9. Checklists of Birds of Jawahar Nagar

Species recorded	1996–2004	2005–2010	Migrants
Barn Swallow *Hirundo rustica*	X	X	M
Red-rumped Swallow *Cecropis daurica*	X	X	
Greenish Leaf Warbler *Seicercus trochiloides*	X	X	M
Blyth's Reed Warbler *Acrocephalus dumetorum*		X	M
Ashy Prinia *Prinia socialis*	X		
Plain Prinia *P. inornata*	X		
Common Tailorbird *Orthotomus sutorius*	X	X	
Jungle Babbler *Turdoides striata*	X	X	
Yellow-billed Babbler *T. affinis*	X	X	
Jungle Myna *Acridotheres fuscus*	X	X	
Common Myna *A. tristis*	X	X	
Chestnut-tailed Starling *Sturnia malabarica*	X	X	M
Malabar Starling *S. blythii*	X	X	
Rosy Starling *Pastor roseus*		X	M
Orange-headed Thrush *Geokichla citrina*	X		
Oriental Magpie Robin *Copsychus saularis*	X	X	
Indian Robin *Saxicoloides fulicatus*	X	X	
Asian Brown Flycatcher *Muscicapa dauurica*	X		M
Brown-breasted Flycatcher *M. muttui*	X	X	M
Rusty-tailed Flycatcher *M. ruficauda*	X		M
Blue-winged Leafbird *Chloropsis cochinchinensis*	X		
Pale-billed Flowerpecker *Dicaeum erythrorhynchos*	X	X	
Purple-rumped Sunbird *Leptocoma zeylonica*	X	X	
Purple Sunbird *Cinnyris asiaticus*	X	X	
Loten's Sunbird *C. lotenius*	X	X	
House Sparrow *Passer domesticus*	X		
Yellow-throated Sparrow *Gymnoris xanthocollis*	X		
White-rumped Munia *Lonchura striata*	X	X	
Scaly-breasted Munia *L. punctulata*	X	X	
Black-headed Munia *L. malacca*	X		
Forest Wagtail *Dendronanthus indicus*		X	M
Grey Wagtail *Motacilla cinerea*	X	X	M
White-browed Wagtail *M. maderaspatensis*	X	X	

develop conservation strategies and fixing priorities, a thorough understanding of biodiversity is essential, and can be better understood if areas are regularly monitored. Activities like planting more fruit trees, providing bird baths, and artificial nest boxes, in different places of the locality, *etc.,* should be promoted.

References

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