

Population Trend of the common birds in Jawahar Nagar Residential area in Thiruvananthapuram city, Kerala.

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Abstract

A study was carried out on the status and distribution of the avian fauna in Jawahar Nagar residential area, Kawdiar, Thiruvananthapuram, Kerala during the period from 2005 March to 2010 March. Diversity and abundance of the bird population in the study area were assessed through systematic, regular, repeated surveys. 77 birds were identified from the study area during the study period. 213 field hours were spent in the field. 77 species of birds observed represented 34 families, 1 Near Threatened, 4 Schedule I, 15 migrants, 62 residents and 2 habitat specialists. House Sparrows (*Passer domesticus*), which were abundant during the 1990's were totally absent during the study period. The data analysis showed a gradual increase in the diversity and abundance of birds in the initial years and then a decrease in the last year. Incidentally lots of disturbances such as new constructions, habitat destruction etc. happened in the study area during this period. The study noted increase in some species of birds especially Blue Rock Pigeon (*Columba livia*) with the rise of huge buildings in the area. The study observed the breeding of 40 species and 31 nesting trees and more than 10 nesting sites other than trees and shrubs. One large roosting site was also observed in the study area (9 species of birds 10,000+ in number). The guild structure analysis of the birds showed an equal representation of insectivores and carnivores (20 species each). As birds are the visible indicators of the health and quality of the environment to which they belong, fixing priorities and developing strategies for their conservation is inevitable for a healthy urban living.

Key words: species, surveys, urban birds, population trend, abundance, habitat destruction,

Introduction

Birds are among the best known parts of the Earth's biodiversity. Birds are good indicators of biodiversity and environmental change. They occur in a range of habitats in considerable numbers, reflect changes in other life forms, and are responsive and sensitive to environmental change. Their population change in a habitat can be used to make strategic conservation planning decisions for the wider environment. Birds can be excellent barometers of the health of the wider environment and of the sustainability of human activities (Bibby 1999, Niemi *et al.* 1997). They are the inevitable species in all kinds of habitats, from urban to rural, woods to plains, poles to deserts etc. Despite birds being the best known class of living organisms there are still substantial gaps in our knowledge of the distributions, abundances and densities of species. Urban habitats are continuously exposed to alterations, unpredictable anthropogenic disturbances and other developmental activities. Effects of these disturbances would be reflected in the urban bird population. The present paper gives the population trend of the urban birds in a residential area in Thiruvananthapuram, Kerala.

Common birds monitoring

Monitoring is a simple step ahead from a survey. Monitoring undertakes regular repeated surveys and it can estimate the population trend of bird species over a time. Consistency of method is essential here to measure actual population fluctuations. Population trend data are crucial in setting species conservation priorities. A species whose population is declining will be of higher conservation priority than one that is not. The method can be used to assess environmental changes on the behavior of birds. The common birds census (CBC) was started in UK in 1962 to monitor the breeding bird population. The CBC recorded the declines in many common bird species such as the Song Thrush and the Skylark, and the general decline of many farmland birds affected by the changes in agriculture in UK over the last 30 years. Same time the census could bring out the population trend of species such as the Sparrow Hawk, which has declined previously in the 1950s and 60s due to the extensive use of organochloride pesticides, later on environmental change has brought recovery and expansion of populations. Environmental changes are now so extensive that it is necessary to measure their impacts on biodiversity at regional or even continental levels.

Study area

The study was carried out in Jawahar Nagar residential colony located in heart of Thiruvananthapuram, the capital city of Kerala. It is one of the oldest residential areas of the city near Raj Bhavan, the residence of the Governor of Kerala. The elderly residents of the colony say that the area was a well wooded hillock during 1950's, with many fresh water ponds and had vast lush green paddy fields in the eastern side. Tapioca Research Station under the Kerala Agricultural University functioned here during that time. The area was known as 'Maracheenivila' meaning land of tapioca. After the formation of the State of Kerala in 1956, the area was converted to residential plots paving way for hundreds of buildings, bungalows and quarters for the government officials and bureaucrats. The thickets and patches of groves were cleared off., the ponds and marshes were filled up. Instead of the old indigenous trees, new exotic tree species and garden plants came in. By 1970 the area was totally converted to a residential area. The real estate boom which reached its peak during the study period influenced in changing the landscape of Jawahar Nagar forever. The huge flats destroyed the remaining trees, open lands and marshy areas. More than 200 new buildings and 11 huge flats came up during the study period in the residential colony.

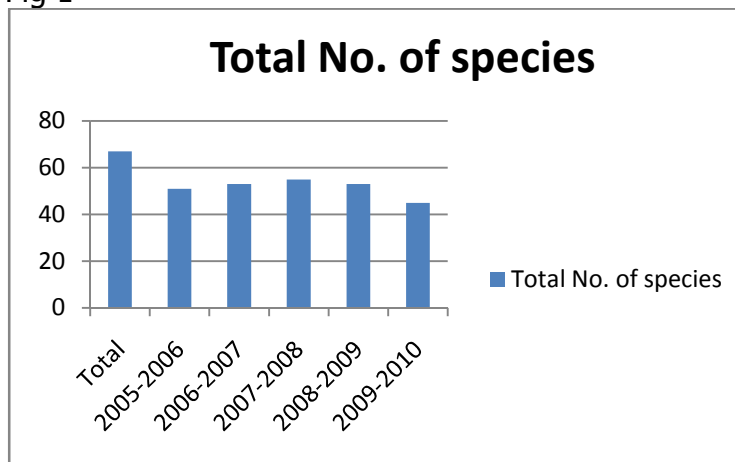
Methodology

The study intended to bring out the status and distribution of the common bird population of the locality. A regular monitoring of the birds of the residential colony was carried out for a period of five years from March 2005 to March 2010. A Transect with 1.4 km length was selected along the main road passing through the center of the residential colony, which was walked in one hour in the morning between 6.30 AM to 9.30 AM. The birds observed by sight or call on either side of the road were recorded. Surveys were carried out once in every week in the first four years and once in a month during the last year. The birds observed in the area outside the transect hours also were noted down and added to the species list. The activities of birds like feeding, displays, nesting etc. were recorded whenever we happened to observe them.

Results and discussions

We observed 77 species during the study period, out of which 67 were observed during the transect hours. A total of 213 field hours were spent in the field along the transect alone in these 5 years. The average count of birds observed per transect was 153.61 and the average number of species was 23.69. Minimum number of species observed in a survey was 18 and the maximum was 36. Greater number of species was observed during winter. Maximum count of birds was 251 and minimum count was 87. Total number of species in each year increased till the third year and after that it decreased (Fig. 1). In the last year the no. of species was only 45. But this year surveys were done once in a month. Also lots of distractions and changes happened during these years in the study area such as increase in the number of buildings, increase in garbage, habitat destruction etc. These changes may have its implications on the bird population.

Fig 1



Encounter rate

The encounter rate of the 67 species per 10 hour were calculated. Based on the encounter rate birds were classified into different ordinal scales to assess abundance. Different ordinal scales are given in the Table 1. See also the Fig 2. There were 11 birds which were found abundant - they are present in almost every survey day. They are Blue Rock Pigeon (*Columba livia*), House Crow (*Corvus splendens*), Common Myna (*Acridotheres tristis*), Asian Koel (*Eudynamys scolopacea*), Black Kite (*Milvus migrans*), Common Tailorbird (*Orthotomus sutorius*), Jungle Crow (*Corvus macrorhynchos*), Purple-rumped Sunbird (*Nectarinia zeylonica*), Rose-ringed Parakeet (*Psittacula krameri*), Tickle's Flowerpecker (*Dicaeum erythrorhynchos*) and White-cheeked Barbet (*Megalaima viridis*). Blue Rock Pigeon (283.62) was found to be the most abundant bird followed by House Crow (276.24). In the first two years House Crow was the most abundant bird, but from 3rd year of the survey onwards Blue Rock Pigeon over took House Crow in number. (See fig 3). Incidentally this was period the study area witnessed the rise of huge buildings and flats. Top of the air conditioners projecting outside the buildings, air holes and ventilators of these huge buildings were excellent breeding spaces for Blue Rock Pigeons.

Table 1

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

Fig 2

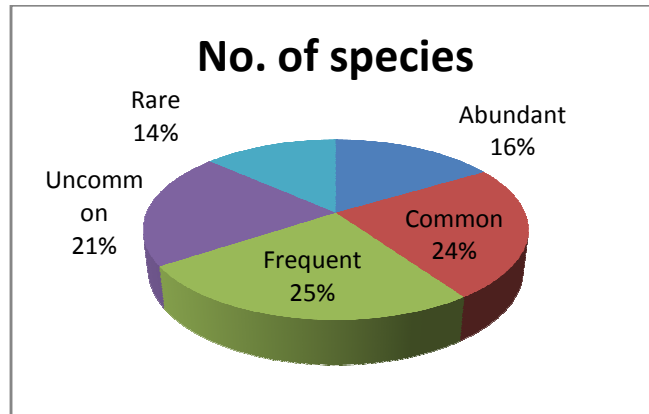
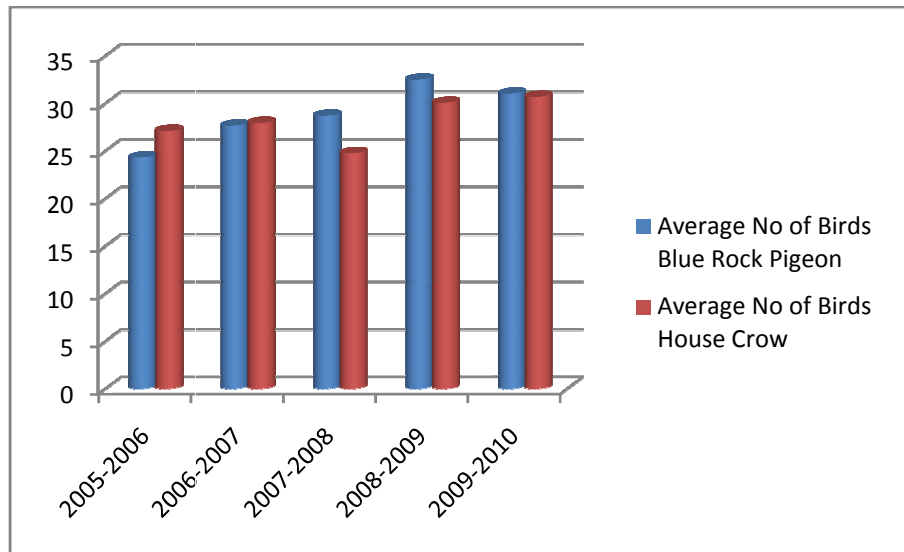


Fig 3



8 birds were found rare in the survey. And they were Ashy Wood-swallow (*Artamus fuscus*), Asian Open-billed Stork (*Anastomus oscitans*), Bronze-winged Jacana (*Metopidius indicus*), Brown Hawk-owl (*Ninox scutulata*), Indian Roller (*Coracias benghalensis*), Chestnut Bittern (*Ixobrychus cinnamomeus*), Oriental Honey Buzzard (*Pernis ptilorhynchus*), Plum-headed Parakeet (*Psittacula cyanocephala*) and Rosy Starling (*Sturnus roseus*). According to the assessment 16 species of birds belong to common category, 17 number of species belong to Frequent category and 14 belong to uncommon category. Pompadour Green pigeon (*Treron pompadora*) and Yellow legged green pigeon (*Treron phoenicoptera*) were sighted from the study area and they are listed under uncommon.

Migratory Status

15 species of birds (Table 2) out of 77 observed during the study period were migrants.

Table 2. List of Migrants.

Migrant species	Scientific Name
Cattle Egret	<i>Bubulcus ibis</i>
Alpine Swift	<i>Tachymarptis melba</i>
Blue-tailed Bee-eater	<i>Merops philippinus</i>
Common Swallow	<i>Hirundo rustica</i>
Forest Wagtail	<i>Motacilla indicus</i>
Grey Wagtail	<i>Motacilla cinerea</i>
Blyth's Reed-Warbler	<i>Acrocephalus dumetorum</i>
Greenish Leaf-Warbler / Green Leaf-Warbler	<i>Phylloscopus trochiloides</i>
Brown-breasted Flycatcher	<i>Muscicapa muttui</i>
Asian Paradise-Flycatcher	<i>Terpsiphone paradisi</i>
Grey-headed Starling	<i>Sturnus malabaricus</i>
Rosy Starling	<i>Sturnus roseus</i>
Eurasian Golden Oriole	<i>Oriolus oriolus</i>
Black-naped Oriole	<i>Oriolus chinensis</i>
Ashy Drongo	<i>Dicrurus leucophaeus</i>

One interesting observation was that the migrants - Greenish Leaf-Warbler (*Phylloscopus trochiloides*), Forest Wagtail (*Motacilla indicus*), Cattle egret (*Bubulcus ibis*) and Eurasian Golden Oriole (*Oriolus oriolus*), all are in the common bird category (encounter rate between 6-60). Greenish Leaf-Warbler and Forest Wagtails are the earliest migrants reaching Jawahar Nagar. Both of them along with Eurasian Golden Oriole retained a consistent population in the study area. The data shows that they are spending more time (almost 7 months) in the study area. Also they maintained consistency in the timings of arrivals in winter and back journey after the migratory season. Table (3) showing the last sightings in summer and first sightings in winter of these birds during the migratory season is given.

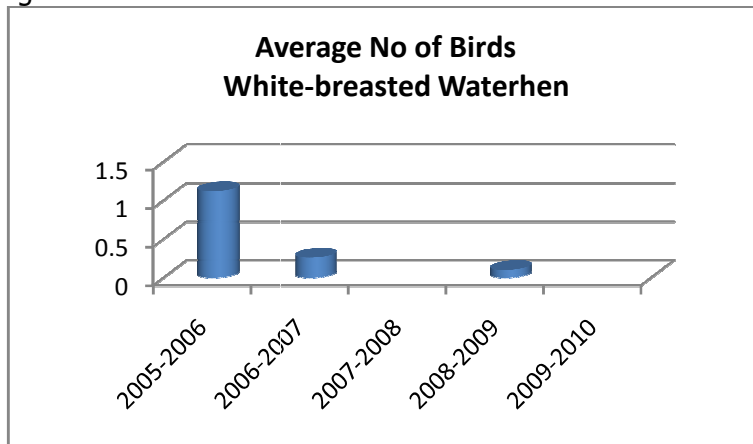
Table 3

Year	Greenish Leaf-Warbler		Forest Wagtail		Eurasian Golden Oriole	
	Last sighting - summer	First sighting - winter	Last sighting - summer	First sighting - winter	Last sighting - summer	First sighting - winter
2005	Apr 30	Oct 14	Apr 3	Oct 14	Apr 20	Nov 24
2006	Apr 7	Sept 26	Mar 28	Oct 27	Apr 7	Nov 16
2007	Apr 4	Oct 16	Mar 28	Oct 23	Apr 4	Nov 5
2008	Apr 7	Oct 30	Apr 7	Oct 1	Apr 15	Nov 15
2009	Apr 6	Oct 30	Apr 6	Sept 26	Apr 6	Oct 30

Decline in the population of White-breasted Waterhen

Another important observation was the decline in the numbers of White-breasted Waterhen (*Amaurornis phoenicurus*). White-breasted Waterhen is a species common in wetlands and marshes. The bird belongs to the guild category Carnivore Aquatic. The figure 4 below shows the presence of the species in the study area during the initial years and the decline in the population towards the end of the study. White-breasted Waterhen was totally absent in the last year. The reason of the decline and absence in the last year survey may be the loss of their habitats- wetlands, marshes and open lands.

Fig 4



Breeding and Nesting records

Breeding activities of 40 species were recorded from the study area. This included observations of nests, nest making, birds with nesting material, feeding chicks, sightings of chicks, juveniles, immature and sub adults, courtship display, breeding song, etc.

A total of 620 nests of 33 species were observed during the study period. Total number of nesting trees and shrubs were 31 and these included exotic (14) as well as indigenous (17). List of the nesting trees, shrubs and plants are given in table 4. A total of 142 species of trees and shrubs were identified from the residential area through a separate survey.

Table 4

Sl. No.	Nesting Trees, plants and shrubs .	Scientific Name
1	Coconut Palm	<i>Cocos Nucifera</i>
2	Spathodea	<i>Spathodea campanulata</i>
3	Gulmohar	<i>Delonix regia</i>
4.	Kassoda Tree (Manja Konna)	<i>Cassia siamea</i>
5.	Jackfruit Tree	<i>Artocarpus heterophyllus</i>
6.	Mango Tree	<i>Mangifera indica</i>
7.	Aini Tree	<i>Artocarpus hirsutus</i>
8.	Indian Banyan Tree	<i>Ficus benghalensis</i>
9.	Arecanut Palm	<i>Areca catechu</i>
10.	Nutmeg Tree	<i>Myristica fragrans</i>
11	Banana (Plantain)	<i>Musa sp.</i>
12	Garlic climber	<i>Adeno calymma Alliaceum</i>
13.	Teak	<i>Tectona grandis</i>
14.	Hibiscus (red and white)	<i>Hibiscus rosa-sinensis</i>
15.	Bougainvillea (paper plant)	<i>Bougainvillea glabra</i>
16	Divi –divi tree	<i>Caesalpinia coriaria</i>
17.	Bauhinia	<i>Bauhinia acuminata</i>
18	Tamarind Tree	<i>Tamarindus indica</i>
19	Kilimaram	<i>Commiphora caudata</i>

20	Amla	<i>Emblica officinalis</i>
21	Rain tree	<i>Samanea saman</i>
22	Bird Cherry	<i>Prunus padus</i>
23	Kasi (Mulluvenga)	<i>Bridelia retusa</i>
24	Neem tree	<i>Azadirachta indica</i>
25	Ixora	<i>Ixora coccinea</i>
26	Poomaruthu	<i>Lagerstroemia reginae</i>
27	Palmyrah Palm Tree	<i>Borassus flabellifer</i>
28	Ornamental palm	<i>Arecaceae sp.</i>
29	Croton plant	<i>Euphorbiaceae sp.</i>
30	Unknown grass	<i>Gramineae sp.</i>
31	Unknown wild plant	-

Coconut palm was found to be the most favourite nesting tree and it was used by 13 species of birds and they built 213 nests in these trees. Spathodea was the next favourite nesting tree (135 nests belonging to 8 species). Other nesting sites included sodium vapour lamp, lamp shades of street lights, air holes and ventilators of buildings, tops of the AC boxes, telephone and electric posts, drainage pipes, mud walls of old houses, in between the tiles of the roofs, mudpots, hanging ropes etc. Oriental Magpie Robin (*Copsychus saularis*), a hole nester, used tree holes, air holes of buildings, holes on the mud walls of old buildings, space between the tiles of roofs, drainage pipes, telephone and electric posts, sodium vapour lamps, lamp shades and mud pots. This is an example of successful adaptation of a bird to an urban environment. List of the breeding birds, nesting months and the nesting stratum are given in the table 5.

Table 5

SI No.	Species	Months of Nesting records	Nesting trees and other Nesting sites
1	Black Kite	October, January, February, April	Coconut palm , Aini tree , Tamarind tree
2	Brahmany Kite	December, March	Coconut palm
3	Shikra	December, February, April	Coconut palm , Aini tree
4	White-breasted Waterhen	August, January, February	Areca nut palm, Vegetation near a stream
5	Blue Rock Pigeon	All months except June and July	Sunshades, air holes and top of a/c boxes in buildings and flats
6	Rose-ringed Parakeet	December, January, March, April	Coconut tree, Spathodea, Kassoda tree.
7	Greater Coucal	April, May	Mango tree, Nutmeg tree
8	Jungle Owlet	April, May	Coconut palm, Spathodea tree
9	Spotted Owlet	April	Coconut palm, Spathodea tree
10	Asian Palm Swift	April	Palmyrah Palm
11	White-breasted Kingfisher	July	Side wall of well
12	Indian Roller	January, March	Telephone post, Coconut palm
13	White-cheeked Barbet	September to March	Coconut, Spathodia, Mango, Kassoda
14	Coppersmith Barbet	February, April	Coconut, Spathodia
15	Lesser Golden-backed Woodpecker	December, January, February, April	Coconut
16	Large Pied Wagtail	June	Side wall of a Water Tank
17	Red-whiskered Bulbul	December, January, June	Ornamental Palm, Croton plant, Hibiscus, Ixora, Kilimaram
18	Oriental Magpie Robin	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
19	White-headed	September, July	Banana plant

	Babbler		
20	Common Tailorbird	December, January, March, April	Teak, Bauhinia, Parakam (a wild plant), Garlic climber
21	Tickell's Flowerpecker	December, January, April	Mango tree, Bird cherry
22	Purple-rumped Sunbird	December, January, April	Hibiscus, Bougainvillea
23	Purple Sunbird	September, November, April	Hibiscus
24	Loten's Sunbird	January, April	Hanging ropes and abandoned wires, Hibiscus
25	White-rumped Munia	November, January, February	Divi divi, Croton plant, Bauhinia, Neem tree
26	Spotted Munia	March	Lamp shade of a street light.
27	Common Myna	September to March	Arecanut palm, Coconut palm, Spathodea, Lamp shade, Telephone post, Sodium vapour lamp
28	Jungle Myna	December, January, February,	Coconut palm, Sodium vapour lamp
29	Black-headed Oriole	October, November	Jackfruit tree, Poomaruthu
30	Black Drongo	March	Jackfruit tree
31	Indian Treepie	March, April	Tamarind tree, Jackfruit tree, Amla tree, Rain tree
32	House Crow	All months except November	Coconut palm, Spathodea, Indian Banyan tree, Kassoda tree(Manja Konna), Jackfruit tree, Mango tree, Aini tree, Gulmohar
33	Jungle Crow	September to March	Coconut palm, Spathodea, Kassoda tree, Indian Banyan tree, Rain tree

Maximum number of nests recorded during the study period was that of Blue Rock Pigeons (296), followed by House crow (120). Table 6 shows the number of nests in each month made by Blue rock Pigeon and House Crows

Table 6

Year	Mar		Apr		May		June		July		Aug		Sept		Oct		Nov		Dec		Jan		F
	BRP	HC	BRP	HC	BRP	HC	BRP	HC	BRP	HC	BRP	HC	BRP	HC	BRP	HC	BRP	HC	BRP	HC	BRP	HC	BRP
2005-2006	10	6	11	7	4	2		1					2		5	2	4		5	3	4	5	6
2006-2007	8	5	13	5	5	1					2	2	2	1	6				9	4	5	3	7
2007-2008	10	4	9	8	8	2					5		4	2		1	6		7		4	1	9
2008-2009	8	7	11	5	7	1		2					9	1		2			6	2	7	4	7
2009-2010	15	5	21	4	7	1			1	3			1			4			5	2	5		11
Total	51	27	65	29	31	7		3		1	10	2	17	5	11	5	14		32	11	25	13	40

(BRP- Blue Rock Pigeon , HC- House Crow)

The peak breeding seasons for both the birds were March and April each year. No active nests of Blue Rock Pigeons were observed in the months of June and July. Similarly we couldn't find any House Crow nests in November. White-cheeked Barbet (*Megalaima viridis*), Common Myna (*Acridotheres tristis*), Red-whiskered Bulbul (*Pycnonotus jocosus*) and Jungle Crow (*Corvus macrorhynchos*) were the next most successful breeding species of the study area during the study period. Their breeding period were from September to April every year. House Crow made their nest in 8 different trees, Jungle Crow in 5 different trees and Red-whiskered Bulbul in 5 different trees and shrubs.

The number of trees used for nesting and the number of nests made each year were found to be decreasing over the years during the survey period. The number of trees used for nesting decreased from 19 to 9 and the number of nests from 144 to 98. See table 7.

Table 7

Year	No. of trees used for nesting	No. of nests
2005-2006	19	144
2006-2007	17	136
2007-2008	12	125
2008-2009	10	117
2009-2010	9	98

One large roosting site was also observed in the study area. We could find more than thousand birds representing 9 species of birds in the roost. The species were House Crow, Jungle Crow, Common Myna, Indian Treepie (*Dendrocitta vagabunda*), White-cheeked Barbet, Red-whiskered Bulbul, Indian Pond Heron (*Ardeola grayii*), Cattle Egret (*Bubulcus ibis*) and Little Egret (*Egretta garzetta*). The main roosting trees were the Kassoda tree (Manja Konna), 8 in number and the Rain tree 4 in number.

Bird life of Jawahar Nagar in 1996-2004 and 2005-2010 - a comparison

Though regular surveys were done only from 2005, observations on the bird population of Jawahar Nagar were done from 1996 onwards. Comparing the observations from 1996 onwards and during the study period gives interesting data related to habitat loss and decline in bird population. A total of 104 species representing 44 families and sub families were observed from the study area in 1996 - 2004. Checklist of birds observed in the study area during the regular survey period and the total checklist of birds of Jawahar Nagar are given in the table 10 and in the table 11 respectively. 27 species of birds representing 10 families were totally missing when the regular survey results of 2005 -2010 were analysed. Most of these missing species were woodland birds (16 species) and water birds (7 species). Decline of these bird species from the area is an obvious sign of habitat degradation, with the loss of trees, marshes and ponds. House sparrow which was very common during 1996 to 2000 was absent in the survey period. 1996 to 2004 witnessed a gradual decline in the House Sparrow population and by 2005 the bird became a locally extinct. Black-headed Munia (*Lonchura malacca*) and Bronzed Drongo (*Dicrurus aeneus*) disappeared from the locality. Both were habitat specialist birds. Oriental White Ibis (*Threskiornis melanocephalus*), which was the only Near threatened species in the list -was absent in the regular monitoring period. Indian Edible-nest Swiftlet (*Collocalia 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 are migrants) were the species of birds only observed in 2005-2010 period.

The missing numbers of species under different categories are given in the table 8.

Table 8

	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
Scheduled 1species	7	4
Threatened species	2	1

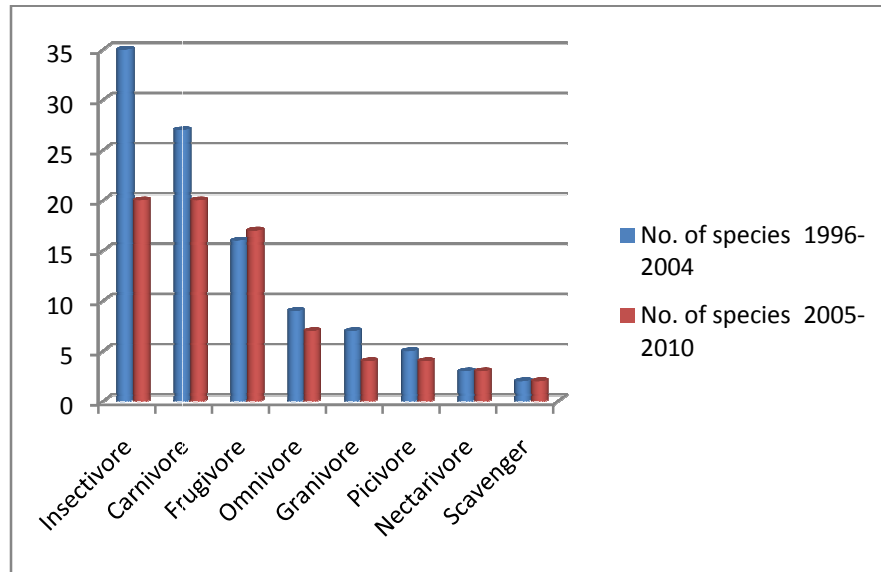
Guild Structure

Feeding guild of all the species were classified into 8 main categories based on their food habits, habitat association, habitat selection, resource use, niche requirements, foraging methods and behaviour. When the two data on feeding guild were compared there were considerable differences in the number of species especially in insectivore and carnivore guild. Insectivore species came down from 37 in 1996 data to 20 in the regular survey period from 2005 and carnivores came down from 27 to 20. Some of the canopy foliage 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 an direct influence on the population decline. Guild classification is given in the table 9 and the difference in number of species in each guild in the two periods is shown in the figure 5.

Table 9

FG Category	No. 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

Fig 5



Conclusion

The presence of 77 birds in the study from a crowded residential area located in the heart of the city reveals the relevance of protecting such areas, though such areas are continuously subjected to developmental and anthropogenic interventions. The population trends of certain species of birds during the study period shows alarming decline in the bird count and signs of local extinction. Places like parks, residential areas act as lungs in an urban ecosystem. They control the microclimate of the region and help purifying the environment. Such areas in the cities are the remaining pockets where birds choose for feeding, nesting and roosting. Conserving and protecting the biodiversity of such places is of utmost importance and that component should come in the town planning and urban development policies. In order to develop conservation strategies and fixing priorities a thorough understanding about the biodiversity should be made. For this a regular monitoring is inevitable. Planting more fruit trees in the area, keeping bird baths and nest boxes in different places of the locality can be done.

Checklists of Birds of Jawahar Nagar.

Table 10

Sl.No	Checklist of birds of Jawahar Nagar during the study period (2005-2010)	
	Common Name	Scientific Name
1	Little Cormorant	<i>Phalacrocorax niger</i>
2	Darter	<i>Anhinga melanogaster</i>
3	Little Egret	<i>Egretta garzetta</i>
4	Median Egret	<i>Mesophoyx intermedia</i>
5	Cattle Egret	<i>Bubulcus ibis</i>
6	Indian Pond-Heron	<i>Ardeola grayii</i>
7	Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>
8	Chestnut Bittern	<i>Ixobrychus cinnamomeus</i>
9	Asian Openbill-Stork	<i>Anastomus oscitans</i>
10	Oriental Honey-Buzzard	<i>Pernis ptilorhynchus</i>
11	Black Kite	<i>Milvus migrans</i>
12	Brahminy Kite	<i>Haliastur indus</i>

13	Shikra	<i>Accipiter badius</i>
14	White-breasted Waterhen	<i>Amaurornis phoenicurus</i>
15	Bronze-winged Jacana	<i>Metopidius indicus</i>
16	Blue Rock Pigeon	<i>Columba livia</i>
17	Spotted Dove	<i>Streptopelia chinensis</i>
18	Emerald Dove	<i>Chalcophaps indica</i>
19	Pompadour Green-Pigeon	<i>Treron pompadora</i>
20	Yellow-legged Green-Pigeon	<i>Treron phoenicoptera</i>
21	Indian Hanging-Parrot	<i>Loriculus vernalis</i>
22	Rose-ringed Parakeet	<i>Psittacula krameri</i>
23	Plum-headed Parakeet	<i>Psittacula cyanocephala</i>
24	Asian Koel	<i>Eudynamys scolopacea</i>
25	Greater Coucal	<i>Centropus sinensis</i>
26	Barn Owl	<i>Tyto alba stertens</i>
27	Collared Scops-Owl	<i>Otus bakkamoena</i>
28	Jungle Owlet	<i>Glaucidium radiatum</i>
29	Spotted Owlet	<i>Athene brama</i>
30	Brown Hawk-Owl	<i>Ninox scutulata</i>
31	Asian Palm-Swift	<i>Cypsiurus balasiensis</i>
32	Alpine Swift	<i>Tachymarptis melba</i>
33	House Swift	<i>Apus affinis</i>
34	Small Blue Kingfisher	<i>Alcedo atthis</i>
35	Stork-billed Kingfisher	<i>Halcyon capensis</i>
36	White-breasted Kingfisher	<i>Halcyon smyrnensis</i>
37	Small Bee-eater	<i>Merops orientalis</i>
38	Blue-tailed Bee-eater	<i>Merops philippinus</i>
39	Indian Roller	<i>Coracias benghalensis</i>
40	White-cheeked Barbet	<i>Megalaima viridis</i>
41	Coppersmith Barbet	<i>Megalaima haemacephala</i>
42	Lesser Golden-backed Woodpecker	<i>Dinopium benghalense</i>
43	Common Swallow	<i>Hirundo rustica</i>
44	Red-rumped Swallow	<i>Hirundo daurica</i>
45	Forest Wagtail	<i>Motacilla indicus</i>
46	Large Pied Wagtail	<i>Motacilla maderaspatensis</i>
47	Grey Wagtail	<i>Motacilla cinerea</i>
48	Red-whiskered Bulbul	<i>Pycnonotus jocosus</i>
49	Oriental Magpie-Robin	<i>Copsychus saularis</i>
50	Indian Robin	<i>Saxicoloides fulicata</i>
51	Jungle Babbler	<i>Turdoides striatus</i>
52	White-headed Babbler	<i>Turdoides affinis</i>
53	Blyth's Reed-Warbler	<i>Acrocephalus dumetorum</i>
54	Common Tailorbird	<i>Orthotomus sutorius</i>
55	Greenish Leaf-Warbler / Green Leaf-Warbler	<i>Phylloscopus trochiloides</i>
56	Brown-breasted Flycatcher	<i>Muscicapa muttui</i>
57	Asian Paradise-Flycatcher	<i>Terpsiphone paradisi</i>
58	Tickell's Flowerpecker	<i>Dicaeum erythrorhynchos</i>
59	Purple-rumped Sunbird	<i>Nectarinia zeylonica</i>
60	Purple Sunbird	<i>Nectarinia asiatica</i>
61	Loten's Sunbird	<i>Nectarinia lotenia</i>
62	White-rumped Munia	<i>Lonchura striata</i>

63	Spotted Munia	<i>Lonchura punctulata</i>
64	Grey-headed Starling	<i>Sturnus malabaricus</i>
64a	Blyth's Starling	<i>Sturnus malabaricus blythi</i>
65	Rosy Starling	<i>Sturnus roseus</i>
66	Common Myna	<i>Acridotheres tristis</i>
67	Jungle Myna	<i>Acridotheres fuscus</i>
68	Eurasian Golden Oriole	<i>Oriolus oriolus</i>
69	Black-naped Oriole	<i>Oriolus chinensis</i>
70	Black-headed Oriole	<i>Oriolus xanthornus</i>
71	Black Drongo	<i>Dicrurus macrocercus</i>
72	Ashy Drongo	<i>Dicrurus leucophaeus</i>
73	Greater Racket-tailed Drongo	<i>Dicrurus paradiseus</i>
74	Ashy Woodswallow	<i>Artamus fuscus</i>
75	Indian Treepie	<i>Dendrocitta vagabunda</i>
76	House Crow	<i>Corvus splendens</i>
77	Jungle Crow	<i>Corvus macrorhynchos</i>

Table 11

Total checklist of the birds of Jawahar Nagar (1996- 2010)		
	Common Name	Scientific Name
1	Little Grebe	<i>Tachybaptus ruficollis</i>
2	Little Cormorant	<i>Phalacrocorax niger</i>
3	Indian Shag	<i>Phalacrocorax fuscicollis</i>
4	Darter	<i>Anhinga melanogaster</i>
5	Little Egret	<i>Egretta garzetta</i>
6	Median Egret	<i>Mesophoyx intermedia</i>
7	Cattle Egret	<i>Bubulcus ibis</i>
8	Indian Pond-Heron	<i>Ardeola grayii</i>
9	Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>
10	Chestnut Bittern	<i>Ixobrychus cinnamomeus</i>
11	Asian Openbill-Stork	<i>Anastomus oscitans</i>
12	Oriental White Ibis	<i>Threskiornis melanocephalus</i>
13	Lesser Whistling-Duck	<i>Dendrocygna javanica</i>
14	Oriental Honey-Buzzard	<i>Pernis ptilorhynchus</i>
15	Black Kite	<i>Milvus migrans</i>
16	Brahminy Kite	<i>Haliastur indus</i>
17	Crested Serpent-Eagle	<i>Spilornis cheela</i>
18	Shikra	<i>Accipiter badius</i>
19	Booted Eagle	<i>Hieraaetus pennatus</i>
20	White-breasted Waterhen	<i>Amauornis phoenicurus</i>
21	Bronze-winged Jacana	<i>Metopidius indicus</i>
22	Yellow-wattled Lapwing	<i>Vanellus malabaricus</i>
23	Red-wattled Lapwing	<i>Vanellus indicus</i>
24	Common Sandpiper	<i>Actitis hypoleucos</i>
25	Blue Rock Pigeon	<i>Columba livia</i>
26	Spotted Dove	<i>Streptopelia chinensis</i>
27	Emerald Dove	<i>Chalcophaps indica</i>
28	Pompadour Green-Pigeon	<i>Treron pompadora</i>
29	Yellow-legged Green-Pigeon	<i>Treron phoenicoptera</i>
30	Indian Hanging-Parrot	<i>Loriculus vernalis</i>
31	Rose-ringed Parakeet	<i>Psittacula krameri</i>
32	Plum-headed Parakeet	<i>Psittacula cyanocephala</i>

33	Brainfever Bird	<i>Hierococcyx varius</i>
34	Asian Koel	<i>Eudynamys scolopacea</i>
35	Greater Coucal	<i>Centropus sinensis</i>
36	Barn Owl	<i>Tyto alba</i>
37	Collared Scops-Owl	<i>Otus bakkamoena</i>
38	Mottled Wood-Owl	<i>Strix ocellata</i>
39	Jungle Owlet	<i>Glaucidium radiatum</i>
40	Spotted Owlet	<i>Athene brama</i>
41	Brown Hawk-Owl	<i>Ninox scutulata</i>
42	Indian Edible-nest Swiftlet	<i>Collocalia unicolor</i>
43	Asian Palm-Swift	<i>Cypsiurus balasiensis</i>
44	Alpine Swift	<i>Tachymarptis melba</i>
45	House Swift	<i>Apus affinis</i>
46	Small Blue Kingfisher	<i>Alcedo atthis</i>
47	Stork-billed Kingfisher	<i>Halcyon capensis</i>
48	White-breasted Kingfisher	<i>Halcyon smyrnensis</i>
49	Small Bee-eater	<i>Merops orientalis</i>
50	Blue-tailed Bee-eater	<i>Merops philippinus</i>
51	Indian Roller	<i>Coracias benghalensis</i>
52	White-cheeked Barbet	<i>Megalaima viridis</i>
53	Coppersmith Barbet	<i>Megalaima haemacephala</i>
54	Common Golden-backed Woodpecker	<i>Dinopium javanense</i>
55	Lesser Golden-backed Woodpecker	<i>Dinopium benghalense</i>
56	Indian Pitta	<i>Pitta brachyura</i>
57	Common Swallow	<i>Hirundo rustica</i>
58	Red-rumped Swallow	<i>Hirundo daurica</i>
59	Forest Wagtail	<i>Motacilla indicus</i>
60	Large Pied Wagtail	<i>Motacilla maderaspatensis</i>
61	Grey Wagtail	<i>Motacilla cinerea</i>
62	Large Cuckoo-Shrike	<i>Coracina macei</i>
63	Black-headed Cuckoo-Shrike	<i>Coracina melanoptera</i>
64	Common Woodshrike	<i>Tephrodornis pondicerianus</i>
65	Red-whiskered Bulbul	<i>Pycnonotus jocosus</i>
66	Red-vented Bulbul	<i>Pycnonotus cafer</i>
67	Common Iora	<i>Aegithina tiphia</i>
68	Jerdon's Chloropsis	<i>Chloropsis cochinchinensis jerdoni</i>
69	Brown Shrike	<i>Lanius cristatus</i>
70	White-throated Ground Thrush	<i>Zoothera citrina</i>
71	Oriental Magpie-Robin	<i>Copsychus saularis</i>
72	Indian Robin	<i>Saxicoloides fulicata</i>
73	Jungle Babbler	<i>Turdoides striatus</i>
74	White-headed Babbler	<i>Turdoides affinis</i>
75	Ashy Prinia	<i>Prinia socialis</i>
76	Plain Prinia	<i>Prinia inornata</i>
77	Blyth's Reed-Warbler	<i>Acrocephalus dumetorum</i>
78	Common Tailorbird	<i>Orthotomus sutorius</i>
79	Greenish Leaf-Warbler / Green Leaf-Warbler	<i>Phylloscopus trochiloides</i>
80	Asian Brown Flycatcher	<i>Muscicapa latirostris</i>
81	Rusty-tailed Flycatcher	<i>Muscicapa ruficauda</i>
82	Brown-breasted Flycatcher	<i>Muscicapa muttui</i>

83	Asian Paradise-Flycatcher	<i>Terpsiphone paradisi</i>
84	Tickell's Flowerpecker	<i>Dicaeum erythrorhynchos</i>
85	Purple-rumped Sunbird	<i>Nectarinia zeylonica</i>
86	Purple Sunbird	<i>Nectarinia asiatica</i>
87	Loten's Sunbird	<i>Nectarinia lotenia</i>
88	White-rumped Munia	<i>Lonchura striata</i>
89	Spotted Munia	<i>Lonchura punctulata</i>
90	Black-headed Munia	<i>Lonchura malacca</i>
91	House Sparrow	<i>Passer domesticus</i>
92	Yellow-throated Sparrow	<i>Petronia xanthocollis</i>
93	Grey-headed Starling	<i>Sturnus malabaricus</i>
93a	Blyth's Starling	<i>Sturnus malabaricus blythi</i>
94	Rosy Starling	<i>Sturnus roseus</i>
95	Common Myna	<i>Acridotheres tristis</i>
96	Jungle Myna	<i>Acridotheres fuscus</i>
97	Eurasian Golden Oriole	<i>Oriolus oriolus</i>
98	Black-naped Oriole	<i>Oriolus chinensis</i>
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100	Black Drongo	<i>Dicrurus macrocercus</i>
101	Ashy Drongo	<i>Dicrurus leucophaeus</i>
102	Bronzed Drongo	<i>Dicrurus aeneus</i>
103	Greater Racket-tailed Drongo	<i>Dicrurus paradiseus</i>
104	Ashy Woodswallow	<i>Artamus fuscus</i>
105	Indian Treepie	<i>Dendrocitta vagabunda</i>
106	House Crow	<i>Corvus splendens</i>
107	Jungle Crow	<i>Corvus macrorhynchos</i>

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