

POPULATION AND DISTRIBUTION OF AVIAN COMMUNITY AT VARIOUS HABITATS IN TRANQUBAR TALUK, NAGAPATTINAM DISTRICT, TAMILNADU, SOUTHERN INDIA

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Abstract

In the present investigation a total number of 52 species of bird were recorded in the entire study period which consists of 13 orders and 29 families. Some of the species yet to be identified. Out of 52 bird species, 37 (71.15%) bird species were Resident (R), 14 (26.92%) bird species were Resident Migrant (RM) and one (1.92%) species was Migrant (M). The minimum population density of bird species recorded were Little grebe (18.75 Birds/km²), Crow pheasant (15.63 Birds/km²), Black winged kite (15.63 Birds/km²), On the other hand, maximum population of bird species recorded were Small green bee eater (175.00 Birds/km²), Common crow (181.25 Birds/km²), Brahminy starling (271.88 Birds/km²), Indian myna (309.38 Birds/km²), House sparrow (362.50 Birds/km²). In the present investigation the density estimates among months of all species were not statistically significant (df = 4, P = 2.152, P > 0.05 one-way ANOVA-test). The Shannon-wiener diversity index, in different seasons among habitats was showed high values in monsoon (x = 3.467) and lower during post monsoon (x = 3.062). Maximum diversity index was recorded during premonsoon season and minimum diversity index was recorded during post monsoon and summer seasons.

Key words: Population, avian diversity, various habitats, Tranqubar Taluk, Tamil Nadu.

INTRODUCTION

Processes associated with urbanization are one of the major causes of landscape change and represent an important threat to biodiversity (Wilcox and Murphy, 1985). Urban planners need better information about the factors affecting the distribution of species and structure of communities in order to create or maintain biodiversity in urban areas. Conservation or restoration efforts related to urban wildlife focus on limiting artificial habitat, developing citizen participation in wildlife conservation, improving the quality of life of urban dwellers, and educating them about ecological concepts (Gilbert, 1989; Adams 1994; Niemela, 1999).

Indian avifauna is one of the most interesting in the world and provides sample opportunity for further significant research in zoogeography and its related aspects of ecology. Apparently the Indian bird population has been dwindling due to direct and indirect impact from increasing human population (Balasubramanian and Maheswaran, 2003), habitat loss, fragmentation, and severe biotic pressure, necessitating documentation of the

current status of bird species for future monitoring and conservation (Ramesh, 2003). Bird community evaluation has become an important tool in biodiversity conservation and for identifying conservation actions in areas of high human pressure (Shang, 1998; Ramesh *et al.*, 2011).

Study of avifaunal diversity is an essential ecological tool which acts as an important indicator to evaluate different habitats both qualitatively and quantitatively (Bibby *et al* 1992). In general the global diversity of birds is decreasing due to anthropogenic disturbances (Stoker, 1972) and climate change (Collias, 1952; Searcy, 1979). It is interesting to note that IUCN Red List of endangered birds has already recognized 1,226 bird species as threatened globally and India with 88 threatened bird species is ranked at seventh position (Bird Life International 2001). The population status and distribution pattern of avian community is essentially unstudied in most of the areas throughout the country. A detailed study is essential to study the population and distribution of bird community in Tranqubar Taluk. In the present study area study on population and distribution of avian community helps us to find out the habitat requirements of different species. Any population conservation programme cannot be proposed before the basic information is collected. No published or unpublished information is available with regard to avian diversity in different habitats of various seasons in Tranqubar Taluk so far. Hence, present study was taken up to determine the population and distribution of avian community in different habitats.

STUDY AREA

The study area is located in the Tranqubar Taluk of Nagapattinam district, which lies on the middle of the coromandel east coast of Bay of Bengal. The district lies between 10°25' and 11°40' North Longitude and 79° 49' and 80° 01' East latitude of Tamil Nadu, India. The Nagapattinam district lies on the shores of the Bay of Bengal between latitude 10.7906°N and Longitude 79.8428°E an area of 2,715 KM² (1,048 sq.mi.). The district capital, Nagapattinam, lies on the eastern coast, 350 km down shout of the state capital Chennai. Tranqubar Taluk study area is a semi urban which is criss crossed by number of metal and Kutcha Roads. It is 27 km away from Mayiladuthurai town. The river Cauvery run through the study area. The Bay of Bengal existed east of just five Km from the study area. In the study area number of wells is located here and there with depth ranged from 5 to 50 feet. Apart from this number of puddles and a few ponds were located. People in the study area depend more upon the agricultural activities. Paddy, banana, coconut, ground nut, sugar cane, cereals, pulses etc., are grown here. Farmers are using number of pesticides and insecticides for their crops. People cut the trees for fire wood. The villagers pump out water through motor for their agriculture activities.

MATERIALS AND METHODS

Bird survey

The present study was carried out in different habitats in Tranqubar Taluk of Nagapattinam district, Tamil Nadu, India between January 2017 and December 2018. Ten square kilometres area fall under the study area. On the basis of vegetation the study area is divided into four habitats viz., a) Agricultural habitat b) Riverine habitat c)

groove and d) Human habitation. The months are passing through four seasons such as pre monsoon (June – August), monsoon (September – November), post monsoon (December – February) and summer (March – May).

The bird survey was conducted on foot. At each transect, observations were made for an hour for all the birds seen and photographed if not identified immediately. Sampling was carried out each month to compare data for variation. Observations were made with 7x50 binocular, mainly in the morning and evening for bird location and identification. Photographs were taken using Nikon 16x50CF binocular and Digital Still Camera (4x Zoom) were used for observations and recorded data. The bird species were confirmed by using field guides of Ali and Ripley (1983) and Grimmett *et al.*, (1998) and Kazmierczak (2000). For taxonomy and nomenclature of birds, “An annotated checklist of birds of the Oriental Region” by Inskipp *et al.* (2001) is consulted. Based on regularly updated checklist the detailed census of birds was conducted by direct count method (Colin *et al.*, 1993). No census was done on days with heavy rain and fog. And in many cases photographs were taken in order to confirm the identification.

The abundance of avian community was estimated by adopting Line Transect Sampling method as suggested by Laake *et al.*, (1993). Totally 13 line transects of one km length and 30 mt. width on each side were laid in different habitats. In Agricultural habitats five line transect were laid, in riverine habitat four line transects were laid, in groove two transects were laid and in human habitat two line transects were laid. The number of transects depend upon the area of each habitat. Care was taken not to cross or overlap the transects. Each transect was laid with an interval of 200 - 300 m distance.

All transects were sampled immediately after sun rise and normally from 06.00 to 08.00 hrs. with normal speed of walk (0.75 to 1.00 km/hr.). The number, perpendicular distance of sighted bird species, age and sex (if possible), date and time were recorded once in a month in all the habitats. Each and every bird sighting's perpendicular distance was measured with the help of a measuring tape. A group of birds was considered as a single individual and only one perpendicular distance to the middle of the flock was measured. The data so obtained was extrapolated to estimate as density (birds/ Sq km). Relative abundance was assessed as ‘very common’ (seen on 75–100% of visits), ‘common’ (seen on 50–74% of visits), ‘uncommon’ (seen on 25–49% of visits), or ‘rare’ (seen on <25% of visits). For wintering migrants, abundance was assessed only during the months they were present. Global threat status follows Bird Life International (2001); national threat status follows IUCN Bangladesh (2000). To find out the population density the following formula was used. Common and scientific names of birds are based on Manakadan and Pittie (2001). Shannon-Wener index was calculated by the Magurran method (1988).

“x”

Population density = -----

2LW

Where,

X = No. of birds observed

L = Length of the transect

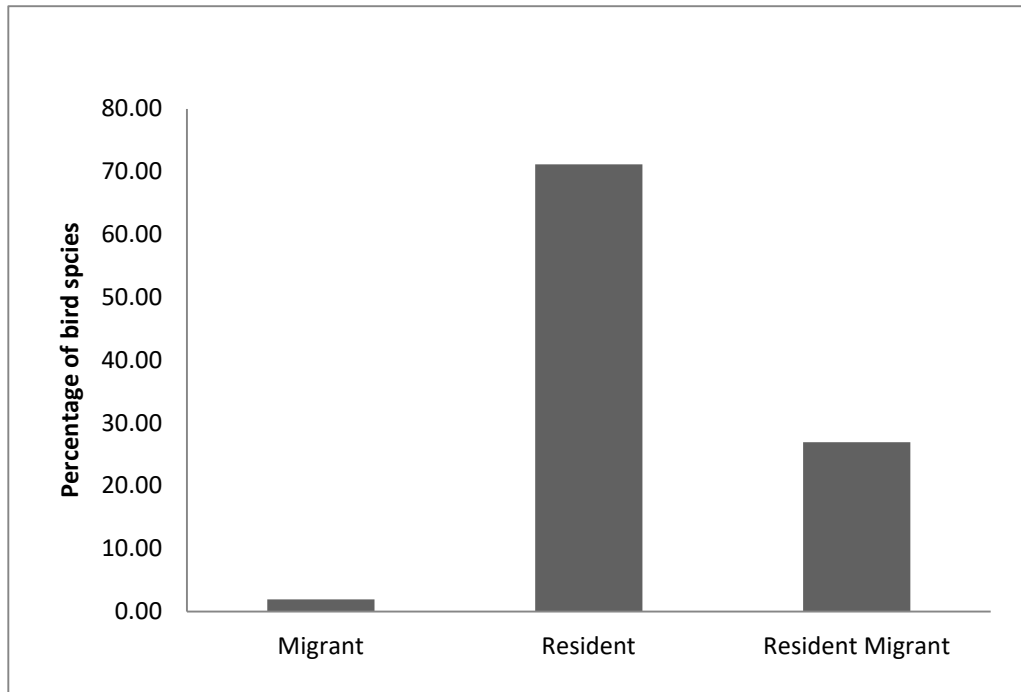
W =Width of the transect

Data analysis: Univariate statistical analysis was conducted using SPSS version 16.0 (Sokal and Rohlf, 1981). Students 't' test was applied to find out the significant difference in the number of birds between summer and monsoon. Diversity was calculated using Shannon-Wener Index ($H' = \sum (p_i \ln p_i)$).

RESULTS AND DISCUSSION

A total number of 52 species of bird were recorded in the entire study period. Some of the species yet to be identified. The 52 species included in 13 orders viz., Ciconiformes, Galliformes, Gruiformes, Columbiformes, Psittaciformes, Strigiformes, Accipitriformes. Strigiformes, Pelecaniformes Piciformes Coraciiformes, Upupiformes and Passeriformes and 29 families viz., Accipitridae, Alcedinidea, Ardeidae, Centropodidae, Cerylidae, Charadriidae. Ciconiidae. Columbidae, Coraciidae, Corvidae, Cuculidae, , Meropidae, Motacillidae. Muscicapidae. Passeridae, Phalacrocoracidae, Pheasianidae, Phylloscopidae. Picidea. Podicipedidae, Psittacidae, Pycnonotidae, Rallidae, Silvidae, Strigidae, Sturnidae, Threskiornithidae. Tytonidae and Upupidae were covered. Out of 52 bird species, 37 bird species were Resident (R), 14 bird species were Resident Migrant (RM) and one species was Migrant (M) (Fig 1). Gaston (1980) opined that the Line Transect Method is the simplest method to get an index of bird population and can be carried out at any time of year. Further, it is found to be reliable method for estimating abundance, density and encounter rates of particular bird species. In the present investigation avian communities variation was observed in different seasons among habitats due to various factors.

Fig 1. Bird species status in Tranqubar Taluk, Nagapattinam district between January 2017 and December 2018



Avian diversity in different Habitats

Bird species were recorded in four different habitats viz., agricultural habitat, riverine habitat, groove and human habitat. The average, percentage and birds per km² were presented in (Table 1). The minimum population density of bird species recorded were Little grebe (18.75 Birds/km²), Crow pheasant (15.63 Birds/km²), Black winged kite (15.63 Birds/km²), Barn owl, Red Wattled Lapwing, Shikra, Lesser pied kingfisher (12.50 Birds/km²), Paddy field pipit, Swallow, Small dove (6.25 Birds/km²) and Asian paradise faycatcher (3.13 Birds/km²) were recorded. On the other hand, maximum population of bird species recorded were Grey partridge (128.13 Birds/km²), Yellow wagtail (128.13 Birds/km²), Common babbler (140.63 Birds/km²), Baya weaver bird (150.00 Birds/km²), Blue rock pigeon (165.63 Birds/km²), Small green bee eater (175.00 Birds/km²), Common crow (181.25 Birds/km²), Brahminy starling (271.88 Birds/km²), Indian myna (309.38 Birds/km²), House sparrow (362.50 Birds/km²). According to Bibby *et al* (2000), ideally, bird population surveys should always be conducted when the target species are most detectable in order to collect as much data as possible. Habitat factors such as tree density, basal area, number of tree species, percent ground cover, present canopy cover and canopy height, are also important in determining diversity. Hilden (1965) informed, terrestrial birds seek their habitats rather than dispersing randomly. According to Begon and Mortimer (1986) many factors were involved in yearly variations in bird densities viz., predation, intra and interspecific resource competition, parasites and diseases, habitat availability and weather.

The density estimates among months of all species were not statistically significant (df = 4, P 2. 152, P > 0.05 one-way ANOVA-test). Of the 52 species of birds sighted a few aquatic birds and high number of terrestrial birds were recorded. Among counts insectivorous, piscivorous, omnivorous, frugivorous, grainivorous, carnivorous and nectarivorous birds were also included. The availability of suitable vegetation structure and composition is therefore at least partially influencing the composition of suburban bird communities in Australia (Green 1984;

Catterall *et al.* 1989). Moss *et al.*, (1982) stated that weather can be important, either by itself or through its effects on food supplies; animals seem to limit their own numbers below any threshold set by weather, food, disease, predation, parasites or places to live. Jarvinen (1983) mentioned density changes associated with variations in availability of food or unusually favourable climatic conditions.

Diversity Index

In the present study variations in the diversity of birds, based on Shannon-wiener diversity index, in different seasons among habitats was carried out. The overall Diversity index showed high values in monsoon ($x=3.467$) and lower during post monsoon ($x=3.062$). Maximum diversity index was recorded during premonsoon season and minimum diversity index was recorded during post monsoon and summer seasons (Table 2).

Conclusion:

In Tranqubar Taluk predators such as kestrel, shikra, harriers, crested serpent eagle, would have threatened the bird species for hunting. Reptiles such as common Indian monitor lizard, rat snake, cobra, may banish some of the bird population. Most probably they may predate the bird species from the roost sites at night. Anthropogenic pressures such as wood cutting, fire, bird hunting, deliberate poisoning, domestication, habitat alternation, pollution would cause the differentiation of avian community in Tranqubar Taluk. This should be monitored immediately to minimize the pressure and to enhance the avian community in Tranqubar Taluk.

Table. 2 Shanon and Weiner diversity index of bird species in different seasons among habitats in Porayar area of Tranqubar Taluk, Nagapattinam district between January 2017 and December 2018.

Season	Various Habitats				OVER ALL
	Agriculture Fields	Riverine area	Groove habitat	Human habitat	
Pre-monsoon	3.283	3.032	3.215	3.186	3.306
Monsoon	3.101	2.715	3.316	3.058	3.467
Post-monsoon	2.741	2.268	2.928	2.795	3.062
Summer	2.955	2.798	2.838	3.197	3.225

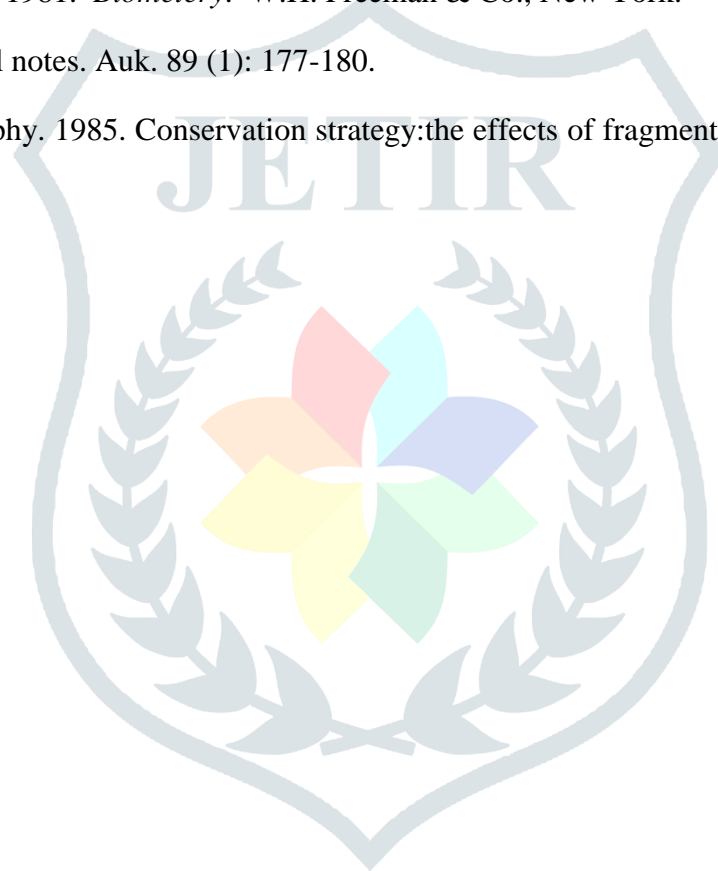
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REFERENCES

- Adams, L.W. 1994. *Urban Wildlife Habitats, a Landscape Perspective*. University of Minnesota Press, Minneapolis, MN.
- Ali, S. and S.D. Ripley . 1983. *A Pictorial Guide to the Birds of the Indian Subcontinent*. Bombay Natural History Society, Oxford University Press, Bombay. Pp. 177.
- Balasubramanian, P. and B. Maheswaran. 2003. Frugivory, seed dispersal and regeneration by birds in south Indian Forests. *J. Bombay Nat. Hist. Soc.* 100 (2&3): 411-431.
- Begon, M. and M. Mortimer. 1986. *Population ecology*. Sinauer Assoc. Sunderland M.A.
- Bibby, C.J., Burgess, N.D. and D.A. Hill. 1992. *Bird census techniques*. Academic Press Limited, London. Pp 267.
- BirdLife International Undated. 2001. Global IBA criteria. www.birdlife.org/datazone/info/ibacritglob.
- Catterall C. P., Green R. J. & Jones D. N. 1989. Occurrence of birds in relation to plants in a subtropical city. *Aust. Wildl. Res.* 16, 289–305.
- Colin, J., D. Bibby, Neil, Burgess, A. David and Hill 1993. *Text book of birds census techniques*. Academic press Ltd., London. Pp. 24-28.
- Collias, N.E. 1952. The development of social behaviour in birds. *Auk.* 69 (2): 127-159.
- Gaston, A.J. 1980. Census techniques for Himalayan pheasants including notes on individual species. *J. World Pheasant Assoc.* 5: 40-53.
- Gilbert, O.L. 1989. *The Ecology of Urban Habitats*. Chapman & Hall, Cambridge, UK.
- Green R. J. 1984. Native and exotic birds in a suburban habitat. *Aust. Wildl. Res.* 11, 181–90.
- Grimmett, R., C. Inskipp., and T. Inskipp. 1998. *Pocket guide to the birds of the Indian subcontinent*. Oxford University Press, Delhi. 384 pp.
- Hilden, O. 1965. Habitat selection in birds a review, *Ann. Zool fenn.* : 53-75.
- Inskipp, C., Grimmett, R and T. Inskipp. 2001. *Birds of the Indian sub content*. Oxford University Press, Delhi.
- IUCN Bangladesh. 2000. *Red list of Bangladesh vol 5*. Oxford University Press, Bangladesh.
- Jarvinen, A. 1983. Breeding strategies of hole nesting passerines in northern Lapland. *Ann. Zool. Fenn.* 20 (1): 129-149.
- Kazmierczak, K. 2000. *A field guide to the birds of India*. Om Book Service, Darya Ganj, New Delhi .
- Laake, J.J., Bckland, S.T., Anderson, D.R. and K.P. Burnham. 1993. *Distance user's guide. Version 2*. Colorado coop. Fish Wildl. Res. Unit. Colorado State Univ. Fort. Collins. Pp 72.
- Magurran, 1988. *Ecological diversity and its measurement*. Springer Dordrecht, USA.
- Manakadan, Ranjith and Aaseesh Pittie 2001. *Standardised common and scientific names to birds of the Indian subcontinent. Buceros vol6, No 1.*

- Moss, A., Watson, A. and J. Ollason. 1982. Outline studies in Ecology: Animal population dynamics. Chapman and Hall, London. Pp 80.
- Niemela, J. 1999. Ecology and urban planning. *Biodiversity and Conservation*, 8, 11–131.
- Ramesh, K. 2003. An ecological study of pheasants of the Great Himalayan National Park, Western Himalaya. Unpublished Ph. D., Thesis. Wildlife Institute of India. Dehradun.
- Ramesh, N., Sathyanarayana, M.C and H. Lloyd. 2011. Abundance of grey Junglefowl (*Gallus sonneratii*) at Theni Forest Division, Western Ghats, India: implication for monitoring and conservation. '*International Journal of Galliformes conservation*'. Vol. 2: 14-21.
- Searcy, W.A. 1979. Sexual selection and body size in male Red-winged Blackbirds. *Evolution*. 33 (2): 649-661.
- Shang, Y.C. 1998. Behavioral ecology. Beijing University Press, Beijing.
- Sokal, R. R. and Rohlf, F. J. 1981. *Biometry*. W.H. Freeman & Co., New York.
- Stokes, A.W. 1972. General notes. *Auk*. 89 (1): 177-180.
- Wilcox, B.A. and D.O. Murphy. 1985. Conservation strategy: the effects of fragmentation on extinction. *American Naturalist*, 125, 879–887.



**Table.1 Bird Species Recorded in Tranqubar Taluk, Nagapattinam district between
January 2016 and December 2018.**

S.No	Family	Order	Scientific Name	Common Name	Status	Habitat				Ave	%	Birds km2
						Agri	Riverine	Groove	Human			
1	Podicipedidae	Ciconiformes	<i>Tachybaptus ruficollis</i>	Little grebe	R	2	4	0	0	1.5	0.51	18.75
2	Phalacrocoracidae	Ciconiformes	<i>Phalacrocorax niger</i>	Little Cormorant	RM	6	2	0	0	2.0	0.68	25.00
3	Ardeidae	Ciconiformes	<i>Bubulcus ibis</i>	Cattle egret	RM	6	2	1	2	2.8	0.93	34.38
4	Ardeidae	Ciconiformes	<i>Ardeola grayii</i>	Pond Heron	R	8	6	1	2	4.3	1.44	53.13
5	Ardeidae	Ciconiformes	<i>Egretta garzetta</i>	Little egret	R	11	2	2	0	3.8	1.27	46.88
6	Accipitridae	Ciconiformes	<i>Elanus caeruleus</i>	Black winged kite	R	2	1	2	0	1.3	0.42	15.63
7	Alcedinidea	Ciconiformes	<i>Ceryle rudis</i>	Lesser pied kingfisher	RM	0	2	2	0	1.0	0.34	12.50
8	Accipitridae	Accipitriformes	<i>Haliastur Indus</i>	Brahminy kite	R	4	2	0	2	2.0	0.68	25.00
9	Accipitridae	Ciconiformes	<i>Accipiter badius</i>	Shikra	R	2	1	1	0	1.0	0.34	12.50
10	Coraciidae	Coraciiformes	<i>Coracias benghalensis</i>	Indian roller	RM	1	2	2	2	1.8	0.59	21.88
11	Picidea	Piciformes	<i>Dinoplum benghalense</i>	Lesser golden backed woodpecker	RM	4	5	4	0	3.3	1.10	40.63
12	Phasianidae	Galliformes	<i>Francolinus pondicerianus</i>	Grey francolin	R	12	15	10	4	10.3	3.48	128.13

13	Pheasianidae	Galliformes	<i>Pavo cristatus</i>	Indian Peafowl	R	2	2	2	0	1.5	0.51	18.75
14	Rallidae	Gruiformes	<i>Amaurionis phoenicurus</i>	Whitebreasted Waterhen	R	2	1	2	1	1.5	0.51	18.75
15	Rallidae	Gruiformes	<i>Terpsiphone paradise</i>	Asian paradise faycatcher	R	1	0	0	0	0.3	0.08	3.13
16	Charadriidae	Ciconiformes	<i>Vanellus malabaricus</i>	Redwattled Lapwing	R	0	0	2	2	1.0	0.34	12.50
17	Columbidae	Columbiformes	<i>Columba livia</i>	Bluerock pigeon	R	15	10	13	15	13.3	4.50	165.63
18	Columbidae	Columbiformes	<i>streptopelia decaocto</i>	Ring Dove	R	15	7	12	4	9.5	3.23	118.75
19	Columbidae	Columbiformes	<i>Streptopelia chinensis</i>	Spotted Dove	R	2	0	0	0	0.5	0.17	6.25
20	Psittacidae	Psittaciformes	<i>Psittachla krameri</i>	Rose ringed parakeet	R	3	5	8	7	5.8	1.95	71.88
21	Cuculidae	Cuculiformes	<i>Cuculus micropterus</i>	Indian Cuckoo	RM	5	2	2	0	2.3	0.76	28.13
22	Cuculidae	Cuculiformes	<i>Eudynamis scolopacea</i>	Koel	R	6	2	2	5	3.8	1.27	46.88
23	Centropodidae	Cuculiformes	<i>Centropus sinensis</i>	Crow pheasant	R	1	0	2	2	1.3	0.42	15.63
24	Tytonidae	Strigiformes	<i>Tyto alba</i>	Barn owl	R	1	0	2	1	1.0	0.34	12.50
25	Strigidae	Strigiformes	<i>Athene brama</i>	Spotted Owlet	R	4	2	4	2	3.0	1.02	37.50
26	Sturnidae	Passeriformes	<i>Sturnus pagodarum</i>	Brahminy starling	RM	25	33	14	15	21.8	7.39	271.88
27	Muscicapidae	Passeriformes	<i>Copsychus saularis</i>	Oriental magpie robin	R	8	5	11	5	7.3	2.46	90.63
28	Muscicapidae	Passeriformes	<i>Saxicoloides fulicata</i>	Indian robin	R	2	0	4	1	1.8	0.59	21.88

29	Cerylidae	Coraciiformes	<i>Halcyon smyrnensis</i>	Whitebreasted Kingfisher	R	4	2	2	4	3.0	1.02	37.50
30	Meropidae	Coraciiformes	<i>Merops orientalis</i>	Small Green Bee Eater	R	24	25	7	0	14.0	4.76	175.00
31	Alcedinida	Coraciiformes	<i>Alcedo atthis</i>	Small blue kingfisher	R	5	2	4	4	3.8	1.27	46.88
32	Upupidae	Upupiformes	<i>Upupa epops</i>	Hoopoe	RM	4	2	4	2	3.0	1.02	37.50
33	Motacillidae	Passeriformes	<i>Motacilla maderaspatensis</i>	Large pied wegtail	RM	2	0	0	0	0.5	0.17	6.25
34	Phylloscopidae	Passeriformes	<i>Phylloscopus magnirostris</i>	Large billed leaf warbler	RM	2	5	4	0	2.8	0.93	34.38
35	Corvidae	Passeriformes	<i>Oriolus oriolus</i>	Golden Oriole	RM	4	2	2	2	2.5	0.85	31.25
36	Corvidae	Passeriformes	<i>Dicrurus adsimilis</i>	Black Drongo	R	10	7	7	3	6.8	2.29	84.38
37	Sturnidae	Passeriformes	<i>Acridrocita tristis</i>	Indian Myna	R	25	50	14	10	24.8	8.41	309.38
38	Corvidae	Passeriformes	<i>Dendrocita vagabunda</i>	Tree Pie	R	2	0	2	4	2.0	0.68	25.00
39	Corvidae	Passeriformes	<i>Corvus splendens</i>	Common Crow	R	15	8	15	20	14.5	4.93	181.25
40	Corvidae	Passeriformes	<i>Corvus macrorhynchos</i>	Jungle Crow	R	7	5	7	11	7.5	2.55	93.75
41	Pycnonotidae	Passeriformes	<i>Pycnonotus cafer</i>	Redvented Bulbul	R	8	10	15	2	8.8	2.97	109.38
42	Silvidae	Passeriformes	<i>Turdoides caudatus</i>	Common babbler	R	15	8	10	12	11.3	3.82	140.63
43	Passeridae	Passeriformes	<i>Orthotomus sutorius</i>	Tailor Bird	R	2	2	2	2	2.0	0.68	25.00

44	Passeridae	Passeriformes	<i>Anthus novaeseelandiae</i>	Paddyfield Pipit	R	2	0	0	0	0.5	0.17	6.25
45	Passeridae	Passeriformes	<i>Motacilla flava</i>	Yellow Wagtail	RM	15	10	4	12	10.3	3.48	128.13
46	Passeridae	Passeriformes	<i>Motacilla cinerea</i>	Grey Wagtail	RM	5	2	4	0	2.8	0.93	34.38
47	Nectarinidae	Passeriformes	<i>Nectarinia zeylonica</i>	Purplerumped Sunbird	R	8	10	0	4	5.5	1.87	68.75
48	Ciconiidae	Ciconiiformes	<i>Anastomus oscitans</i>	Asian open bill stork	RM	5	2	7	3	4.3	1.44	53.13
49	Passeridae	Passeriformes	<i>Passer domesticus</i>	House Sparrow	R	20	11	45	40	29.0	9.86	362.50
50	Passeridae	Passeriformes	<i>Ploceus philippinus</i>	Baya Weaver Bird	R	18	11	7	12	12.0	4.08	150.00
51	Passeridae	Passeriformes	<i>Lonchura Malacca</i>	Black headed munia	R	5	12	12	7	9.0	3.06	112.50
52	Threskiornithidae	Pelecaniformes	<i>Threskiornis melanocephalus</i>	Black headed ibis	M	0	0	8	8	4.0	1.36	50.00
										294.3	100.00	