



Survey of Avifauna of Shriwardhan, District- Raigad MS, India

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Available online at: www.isca.in, www.isca.me

Received 17th October 2014, revised 22nd January 2015, accepted 6th February 2015

Abstract

Today there are all together about 8650 species and 27 orders of living birds in the world. In India there are about 1200 species of birds, representing some 75 families and 20 orders. This is a very high number and represents a great variety for a single country. The reason for this is that India has a great diversity of climates, from moist tropical to the cold arctic of the Himalayan ranges, the dry and hot desert climate of Rajasthan and cool temperate climate of the hilly portions. Survey and sampling method was used. The study was conducted during three seasons. For the study Six different areas with dense vegetation were identified from Shreewardhan taluka namely Dighi, Kudki, Chikhlap, Aravi, Shreewardhan, Harihareshwar. About 64 species of Birds were observed and identified by using various sources at selected sites. These species are included under 34 families. Comparing the availability of bird species at Western Maharashtra (540), Shreewardhan (64) has about 12% of bird diversity observed during the study. The details of finding are discussed in the paper.

Keywords: Shriwardhan, Avian diversity.

Introduction

The part of vast oriental biogeographic regions of the Indian subcontinent is very rich in biodiversity¹. There are more than 9000 bird species in the world out of 1300 (i.e. about 13%) are present in Indian Subcontinent². Birds are one of the best indicators of environmental quality of any ecosystem. Most of the birds have specific habitat requirement from season to season³. It is being suggested that avifauna are important for the ecosystem as they play various roles as a Scavenger, Pollinator and Predators of Insect pest⁴. The developmental projects, Industrialization, Urbanization disturbs avian fauna^{5,6}.

Studies are available on the ecology of birds within State^{7,8}. The Bird Ecology was studied in Bihar⁹, at Kokkare Bellur¹⁰. The avian diversity was studied in Mahim bay, Mumbai¹¹, at Koshi Barrage area in Nepal¹². The ecology of birds of western ghats, Konkan And Malabar was also studied¹³. The species diversity of birds in mangroves of Uran (Raigad) study was conducted¹⁴. Even study of intertidal fauna of thane creek was carried out¹⁵. The aviandiversity in and around Bassein fort and Creek of Thane district was studied¹⁶. mahul creek mumbai¹⁷ study of bird diversity was studied around Western Ghats near Kerala¹⁸⁻²¹. And at Sahyadri Western Ghats²².

Study Area: Shriwardhan is located in Raigad District of State of Maharashtra. Coordinates 18^o02'00"N 73^o01'00"E / 18.0333^oN 73.0167^oE / 18.0333;73.0167

Shriwardhan is a city and municipal council in Raigad district in the Indian State of Maharashtra. It has developed into a seaside resort, along with the nearby town of Harihareshwar, which also has a Shiva temple. Shriwardhan town itself does have many

beaches (Its a Peninsula)- also there are other beautiful beach destinations nearby- like Diveagar Beach and Kondivali beach. People from across Maharashtra come to Shriwardhan and the nearby beaches all around the year.

As of 2001 India census Shriwardhan had a population of 15,187. Males constitute 49% of the population and Females 51%. Shriwardhan has an average literacy rate of 74%, higher than the national average of 59.5%; male literacy is 80% and female literacy is 68% in Shriwardhan, 12% of the population is under 6 years of age.

Material and Methods

Survey and sampling method was used. The study was conducted during three seasons. For the study, 6 different areas from the Shriwardhan taluka were selected on the basis of availability of water-body and dense vegetation and the selected sites were visited in the morning time. The bird species were observed with the help of Binocular and identified on the basis of Call, Contour, Shape, Habitat by using Reference books, internet data, clips of bird call etc^{23,24,25}

During the study some birds which might have escaped notice or observation may be small or less in number or rarely seen. The identified birds were categorized on the basis of their Order, Families and also according to their occurrence throughout the study period

The birds observed during the study were grouped in accordance with the classification as follows: Resident (R) – Birds indigenous and residing in the area throughout the year. Resident-Migrant (RM) – The birds which migrate locally with

in the country. Migrant (M) – The birds which arrive in the area under study from other countries. The birds are also categorized by Modified Method into 3 distinct categories as follows: Common(C) – Frequently in relatively large number, Very Common (VC)- Observed very Frequently, Uncommon (UC) – Observed in relatively low number, Rare (r) Observed very rarely.

Results and Discussion

The present study revealed the presence of 64 species of birds of 35 families belonging to 13 orders. Out of these 48 species were Resident Migrant and 2 species ar Migrant.

On the basis of Order, individual species of Order- Passeriformes were 39% followed by Order- Ciconiiformes 23% and Order Coraciformes 11% were observed to be dominant throughout the study period.

On the basis of Family, Individual species of Family- Passeridae were 8% followed by family-Accipitridae, Aredidae,

Muscicapidae 6% respectively and family- Decelonidae, Corvidae, Phasianidae 5% were observed tobe dominant throughout the study period.

Table-1
Showing Number of Order and the % of bird species

Sr.No.	Order	%
1	Anseriformes	3
2	Apodiformes	1
3	Bucerotiforme	3
4	Ciconiiformes	23
5	Columbiformes	3
6	Coraciformes	11
7	Cuculiformes	3
8	Galliformes	5
9	Gruciformes	2
10	Passeriformes	39
11	Piciformes	3
12	Psitaculiformes	2
13	Stringiformes	2



Figure-1
 (a- Map and b- Satellite image) Showing location of selected sites

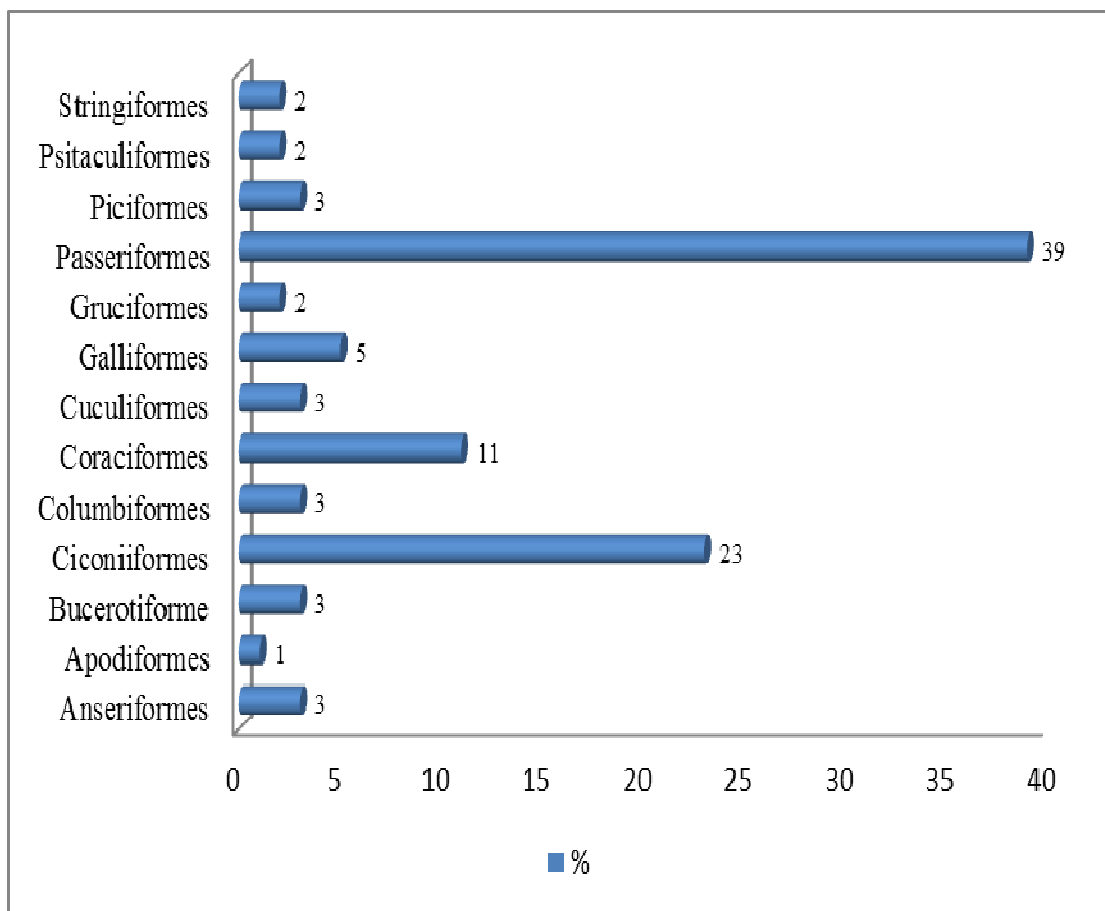


Figure-2
 Showing Number of Order and the % of bird species

Table-2
 Showing Number of Families and the % of bird species

Sr.No.	Family	%	Sr.No.	Family	%
1	Antidae	3	19	Alaudidae	2
2	Apodidae	2	20	Cisticolidae	2
3	Bucerotidae	3	21	Corvidae	5
4	Accipitridae	6	22	Hirudinidae	2
5	Aredidae	6	23	Irinidae	2
6	Birhinidae	2	24	Muscicapidae	6
7	Charadriidae	3	25	laridae	2
8	Phalacrocoracidae	2	26	Nectanidae	2
9	Anhingidae	2	27	Passeridae	8
10	laridae	3	28	Pycnonotidae	3
11	columbidae	3	29	Silvidae	3
12	Alcedinidae	3	30	Sturnidae	3
13	Decelonidae	5	31	Zosteropidae	2
14	Meropidae	3	32	Megalamidae	2
15	Centropodidae	2	33	Picidae	2
16	Cuculidae	2	34	Psitacidae	2
17	Phasianidae	5	35	Tytonidae	2
18	Scolopasidae	2			

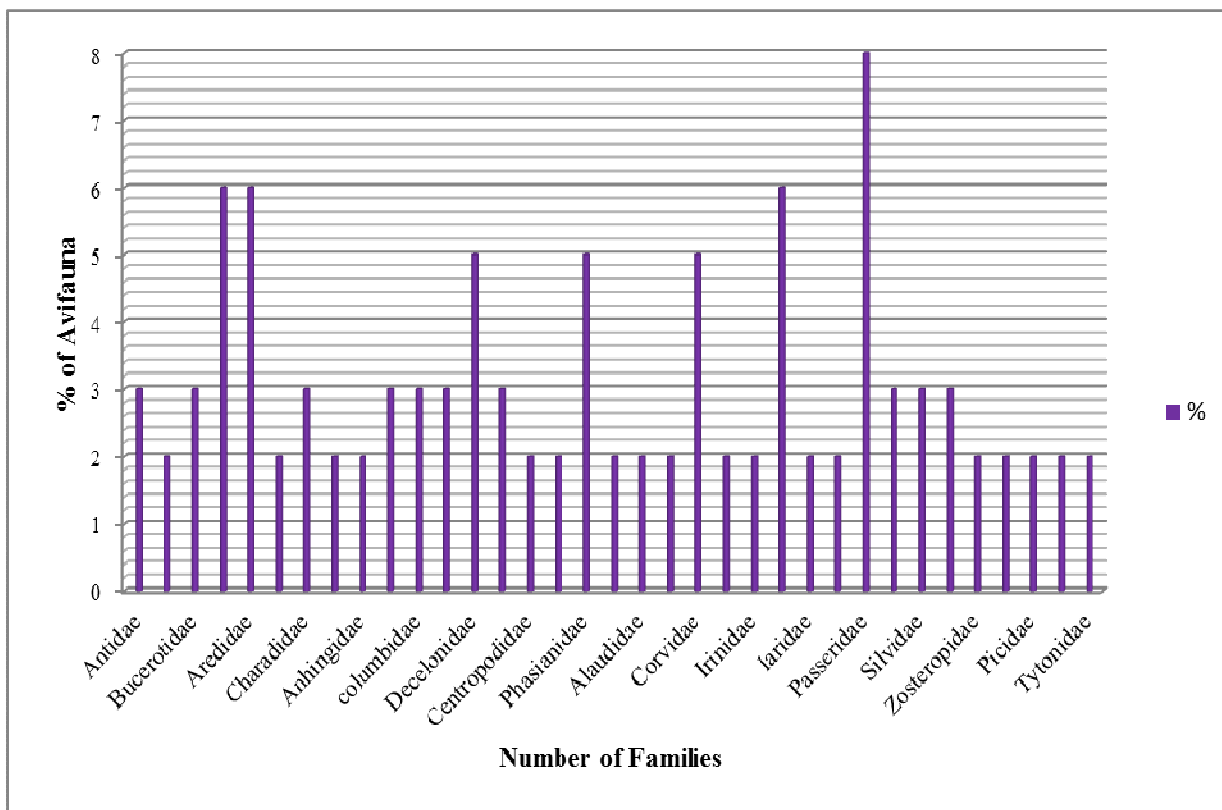


Figure-3
 Showing Number of Families and the % of bird species

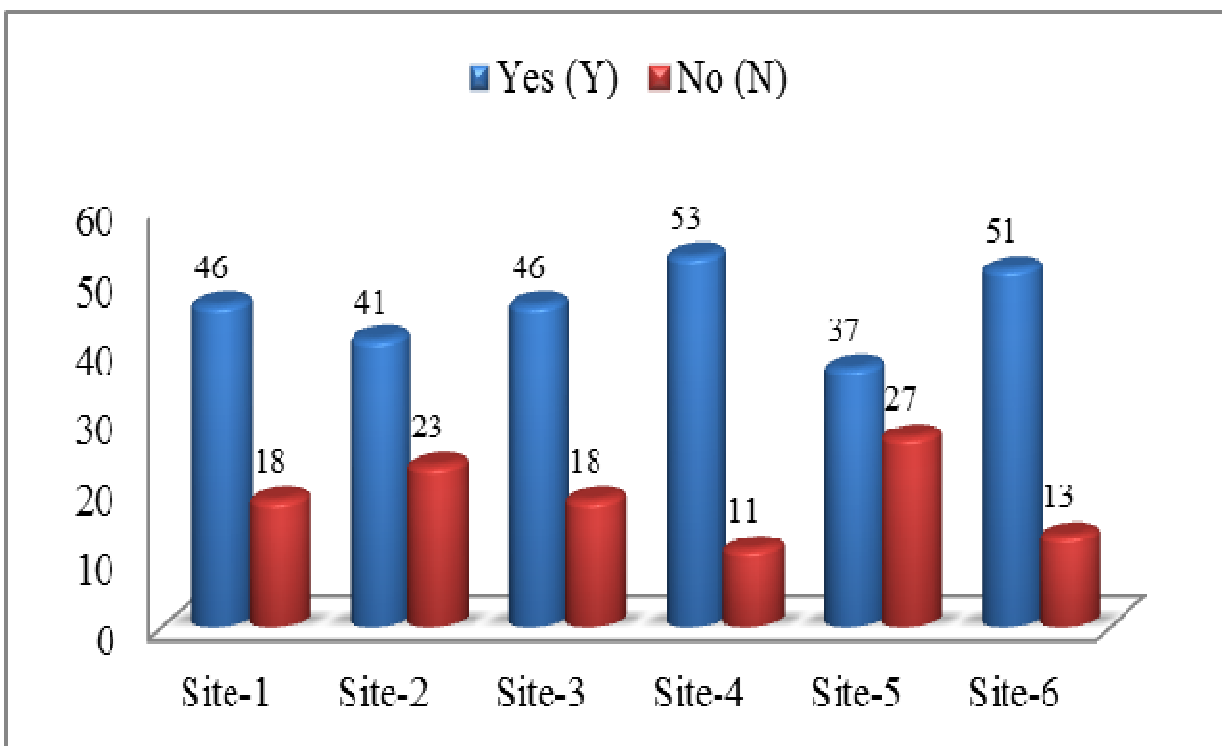


Figure-4
 Showing Availability of Bird species at selected sites

Table-3
Showing Number of Order, families and bird species, with status

Order No.	Order	Sr. No.	Family	English Name	Scientific Name	Local Name	Status
1	Anseriformes	1	Anatidae	Barheaded Goose	<i>Anser indicus</i>	Hans	RM
		2	Anatidae	Spot-Billed Duck	<i>Anas poecilorhyncha</i>	Badak	RM
2	Apodiformes	3	Apodiadae	House Swift	<i>Apus affinis</i>	Babeela	RM
3	Bucerotiformes	4	Bucerotidae	Great pied hornbill	<i>Bucerosbicornis</i>	Banrao	R
		5	Bucerotidae	Malabar pied hornbill	<i>Anthracoceros coronatus</i>	Dhan Chiri	R
4	Ciconiiformes	6	Accipitridae	Brahminy Kite	<i>Haliastur Indus</i>	Khemkarni	R
		7	Accipitridae	Pariah Kite	<i>Haliastur indus (sp)</i>	Cheel	R
		8	Accipitridae	Indian White Backed Vulture	<i>Gyps bengalensis</i>	Gidhad	R
		9	Accipitridae	Shikra	<i>Accipiter badius</i>	Shikra	R
		10	Ardeidae	Cattel Egret	<i>Bubulcus ibis</i>	Gai bagla	RM
		11	Ardeidae	Indian Pond Heron	<i>Ardeola grayii</i>	Andha bagla	R
		12	Ardeidae	Little Egret	<i>Egretta garzetta</i>	Karchia bagla	R
		13	Ardeidae	Large Egret	<i>Casmerodius albus</i>	Bada Bagla	RM
		14	Burhinidae	Stone Curlew	<i>Burhius oediconemus</i>	Barsiri	R
		15	Charadriidae	Red Wattled Lapwing	<i>Vaennus indicus</i>	Titwi	R
		16	Charadriidae	Yellow Wattled Lapwing	<i>Vaennus malbaricus</i>	Titwi	R
		17	Phalacrocoracidae	Little Cormorant	<i>Phalacrocorax niger</i>	Pan-kowwa	RM
		5	Columbiformes	18	Anhingidae	Darter	<i>Anhinga melanogaster</i>
19	Laridae			Yellow legged Gulls	<i>Larus cachinnans</i>	Dhomra	M
6	Coraciiformes	20	Laridae	Little Terns	<i>Sterna albifrons</i>	Not recorded	R
		21	Columbidae	Blue Rock pigeon	<i>Columba livia</i>	Kabutar	R
		22	Columbidae	Spotted Dove	<i>Streptopelia chinensis</i>	Perki	R
		23	Alcedinidae	White Breasted Kingfisher	<i>Halcyon smyrnensis</i>	Kilkila	R
		24	Alcedinidae	Small Blue Kingfisher	<i>Alcedo atthis</i>	Chhota killkila	RM
		25	Dacelonidae	Black Capped Kingfisher	<i>Halcyon pileata</i>	Kourilla	R
		26	Dacelonidae	Stork Billed Kingfisher	<i>Halcyon capensis</i>	Bada Kilkila	R
7	Cuculiformes	27	Dacelonidae	White Breasted Kingfisher	<i>Halcyon smyrnensis</i>	Khandya	R
		28	Meropidae	Small Bee Eater	<i>Merops orientalis Latham</i>	Veda raghu	R
		29	Meropidae	Blue Cheek Bee Enter	<i>Merops persicus Pallas</i>	Bada patringa	RM
7	Cuculiformes	30	Centropodidae	Crow-pheasant or Coucal	<i>Centropus sinensis</i>	Domb Kaola	R
		31	Cuculidae	Koel	<i>Eudynamys scolopacea</i>	Kokila	R
8	Galliformes	32	Phasianidae	Common Pea Fowl	<i>Pavo cristatus</i>	Mor	R

		33	Phasianidae	Common Quail	<i>Coturnix coturnix</i>	Bater	RM
		34	Phasianidae	Grey Jungle Fowl	<i>Gallus sonneratii</i>	Jungli Mmurghi	R
9	Gruciformes	35	Scolopasidae	Common Sandpiper	<i>Tringa/Actitis hypoleucos</i>	Kottan	RM
10	Passeriformes	36	Alaudidae	Crested Lark	<i>Galerida cristata</i>	Chandul	R
	Passeriformes	37	Cisticolidae	Ashy wren Warbler	<i>Prinia socialis</i>	Phutki	R
	Passeriformes	38	Corvidae	House Crow	<i>Corvus splendens</i>	Koala	R
	Passeriformes	39	Corvidae	Black Drongo	<i>Dicrurus macrocercus Vieillot</i>	Kotwal	R
	Passeriformes	40	Corvidae	Jungle Crow	<i>Corvus macrorhynchos Wagler</i>	Dom Kaola	R
	Passeriformes	41	Hirundinidae	Redrumped Swallow	<i>Hirundo daurick</i>	Masjid ababeel	RM
	Passeriformes	42	Irenidae	Jerdon's Chloropsis	<i>Chloropsis cochinchinensis jerdoni</i>	Harawa	R
	Passeriformes	43	Muscicapidae	Indian-Robbin	<i>Saxicila torquata</i>	Kulchuri	R
	Passeriformes	44	Muscicapidae	Mag pie Robbin	<i>Copsychus saularis</i>	Daiya	R
	Passeriformes	45	Muscicapidae	Paradise Flycatcher	<i>Terpsiphone paradise</i>	Kala Latora	RM
	Passeriformes	46	Muscicapidae	Shama	<i>Cocsichus malabaricus</i>	Daiyar	R
	Passeriformes	47	Lanidae	Grey Shirke	<i>Lanies excubitor</i>	Safed latora	RM
	Passeriformes	48	Nectarinidae	Purple Sunbird	<i>Nectarinia asiatica</i>	Chumka	R
	Passeriformes	49	Passeridae	Grey Wagtail	<i>Motacilla caspick</i>	Flava	M
	Passeriformes	50	Passeridae	House Sparrow	<i>Passer domesticus</i>	Gauriyya	R
	Passeriformes	51	Passeridae	Large Pied Wagtail	<i>Motacilla maderaspatensis</i>	Daiya	R
	Passeriformes	52	Passeridae	Tree Pipit	<i>Anthus trivialis</i>	Rujel	RM
	Passeriformes	53	Passeridae	Baya weaver	<i>Pleceus philippinus</i>	Baya	R
	Passeriformes	54	Pycnonotidae	Read Vented Bulbul	<i>Pycnonotus cafer</i>	Bulbul	R
	Passeriformes	55	Pycnonotidae	Read Whiskered Bulbul	<i>Pycnonotus jocosus</i>	Kamera Bulbul	R
Passeriformes	56	Silvidae	Common Babbler	<i>Turdoides caudatus</i>	Dumri	R	
Passeriformes	57	Silvidae	Jungle Babbler	<i>Turdoides striatus</i>	Satbhai	R	
Passeriformes	58	Sturnidae	Common Myna	<i>Acridotheres trists</i>	Salonki	R	
Passeriformes	59	Sturnidae	Jungle Myna	<i>Acridotheres Fuscus</i>	Pahadi myna	R	
Passeriformes	60	Zosteropidae	White Eye	<i>Zosterops palperbrosa</i>	Baboona	R	
11	Piciformes	61	Megalaimidae	Coppersmith Barbet	<i>Megalaima haemacephala</i>	Sonar	R
	Piciformes	62	Picidae	Heart spotted Woodpecker	<i>Hemicircus canente</i>	Katphora	R
12	Psittaciformes	63	Psittacidae	Rose ringed Parakeet	<i>Psittacula krameri</i>	Popat/Tota	R
13	Stringiformes	64	Tytonidae	Spotted Owlet	<i>Athene brama</i>	Chughad	R

Resident (R), Resident-Migrant (RM), Migrant (M)

Table-4
Showing Status of bird species at selected sites on the basis of availability

Sr. No.	English Name of Bird Species	Availability of Bird species at selected sites and their status						
		Site-1	Site-2	Site-3	Site-4	Site-5	Site-6	Status
1	Barheaded Goose	N	N	N	Y	N	Y	r
2	Spot Billed Duck	N	N	N	Y	N	Y	r
3	House Swift	Y	Y	Y	Y	Y	Y	VC
4	Great pied hornbill	Y	Y	Y	N	N	Y	C
5	Malabar pied hornbill	Y	Y	Y	N	N	Y	C
6	Brahminy Kite	Y	Y	Y	Y	Y	Y	VC
7	Pariah Kite	Y	Y	Y	Y	Y	Y	VC
8	Indian White Backed Vulture	N	N	Y	Y	N	Y	UC
9	Shikra	Y	Y	Y	Y	Y	Y	VC
10	Cattel Egret	Y	Y	Y	Y	Y	Y	VC
11	Indian Pond Heron	Y	Y	Y	Y	Y	Y	VC
12	Little Egret	Y	Y	Y	Y	Y	Y	VC
13	Large Egret	Y	Y	Y	Y	Y	Y	VC
14	Stone Curlew	N	N	Y	Y	N	Y	UC
15	Red Wattled Lapwing	N	N	Y	Y	N	Y	UC
16	Yellow Wattled Lapwing	N	Y	Y	Y	Y	Y	VC
17	Little Cormorant	N	Y	Y	Y	Y	N	C
18	Darter	N	Y	N	Y	Y	N	C
19	Yellow legged Gulls	Y	Y	Y	N	Y	N	C
20	Little Terns	Y	Y	Y	N	Y	N	C
21	Blue Rock pigeon	Y	Y	Y	Y	Y	Y	VC
22	Spotted Dove	Y	N	N	Y	N	Y	UC
23	White Breasted Kingfisher	N	Y	Y	Y	N	N	UC
24	Small Blue Kingfisher	Y	Y	Y	Y	Y	Y	VC
25	Black Capped Kingfisher	N	Y	Y	Y	N	Y	C
26	Stork Billed Kingfisher	N	N	N	Y	N	Y	r
27	White Breasted Kingfisher	Y	Y	Y	Y	Y	Y	VC
28	Small Bee Eater	Y	Y	Y	Y	Y	Y	VC
29	Blue Cheek Bee Enter	Y	Y	Y	N	Y	N	C
30	Crow-pheasant or Coucal	Y	Y	Y	Y	Y	Y	VC
31	Koel	Y	Y	Y	Y	Y	Y	VC
32	Common Pea Fowl	Y	N	N	Y	N	Y	UC
33	Common Quail	Y	N	N	Y	N	Y	UC
34	Grey Jungle Fowl	N	N	N	Y	N	Y	UC
35	Common Sandpiper	Y	Y	Y	N	Y	N	C
36	Crested Lark	Y	Y	Y	N	Y	N	C
37	Ashywren Warbler	Y	N	N	Y	N	Y	UC
38	House Crow	Y	Y	Y	Y	Y	Y	VC
39	Black Drongo	Y	Y	Y	Y	Y	Y	VC
40	Jungle Crow	Y	Y	Y	Y	Y	Y	VC

41	Redrumped Swallow	Y	Y	Y	N	Y	N	C
42	Jerdon's Chloropsis	N	N	N	Y	N	Y	r
43	Indian-Robbin	Y	Y	Y	Y	Y	Y	VC
44	Mag pie Robbin	Y	Y	Y	Y	Y	Y	VC
45	Paradise Flycatcher	Y	N	Y	N	N	Y	C
46	Shama	Y	N	Y	N	N	Y	C
47	Grey Shirke	N	N	N	Y	N	Y	UC
48	Purple Sunbird	N	N	N	Y	N	N	r
49	Grey Wagtail	Y	N	N	Y	N	Y	C
50	House Sparrow	Y	Y	Y	Y	Y	Y	VC
51	Large Pied Wagtail	Y	Y	Y	Y	Y	Y	VC
52	Tree Pipit	N	N	N	Y	N	N	r
53	Baya weaver	Y	Y	Y	N	Y	N	C
54	Read Vented Bulbul	Y	Y	Y	Y	Y	Y	VC
55	Read Whiskered Bulbul	Y	Y	Y	Y	Y	Y	VC
56	Common Babbler	Y	N	N	Y	N	Y	C
57	Jungle Babbler	N	N	N	Y	N	Y	UC
58	Common Myna	Y	Y	Y	Y	Y	Y	VC
59	Jungle Myna	Y	N	N	Y	N	Y	C
60	White Eye	N	N	N	Y	N	N	r
61	Coppersmith Barbet	Y	Y	Y	Y	Y	Y	VC
62	Heart spotted Woodpecker	Y	Y	Y	Y	Y	Y	VC
63	Rose ringed Parakeet	Y	Y	Y	Y	Y	Y	VC
64	Spotted Owlet	Y	N	Y	Y	N	Y	C

Common (C), Uncommon (UC), Very Common (VC) Rare (r), Available(Y), Not Available(N)

Site 1- Hareshwar-Adi, Site 2-Shriwardhan-Jivana, Site 3-Aravi-Diveagar, Site 4- Vadavli-Kudki, Site 5- Dighi-Sarva, Site 6- Chikhlap-Devkhol

Table-5
 Showing Availability of Bird species at selected sites

Availability	Site-1	Site-2	Site-3	Site-4	Site-5	Site-6
Yes (Y)	46	41	46	53	37	51
No (N)	18	23	18	11	27	13

Table-6
 Showing % of Bird species Available(Y), Not available(N) at selected sites

Availability	Site-1	Site-2	Site-3	Site-4	Site-5	Site-6
Yes (Y)	17%	15%	17%	19%	13%	19%
No (N)	16%	21%	16%	10%	25%	12%

The study was conducted at 6 different sites from Shriwardhan taluka. Out of 64 species, 53 bird species (19%) were observed at site-4 (Wadavli-Kudki), 51 bird species (19%) were observed at site-6 (Chikhlap-Devkhol). 46 bird species (17%) were

observed at site -1 (Harihareshwar-Adi) and site-3 (Aravi-Diveagar) respectively. 41 bird species (15%) were observed at site-2 (Shriwardhan-Jivna).The minimum number of bird species i.e. 37 (13%) were observed at site-5 (Dighi-Sarva).



Figure-5 (a),(b)
 Showing % of Bird species Available(Y), Not available(N) at selected sites

On the basis of the frequency of bird species at selected sites, the status of bird species was described and the bird species were categorized into Rare, Un-common, Common and Very common. Throughout the study, 7 bird species (11%) were found to be rare, 11 bird species (17%) were found to be uncommon, 18 bird species (28%) were found to be common and 28 bird species (44%) were very common.

Table-7

Showing Status wise number of species available at selected sites and their %

Status	No. of Bird Species	% of Status of Bird species
Rare(r)	7	11%
Un-common(UC)	11	17%
Common (C)	18	28%
Very common (VC)	28	44%

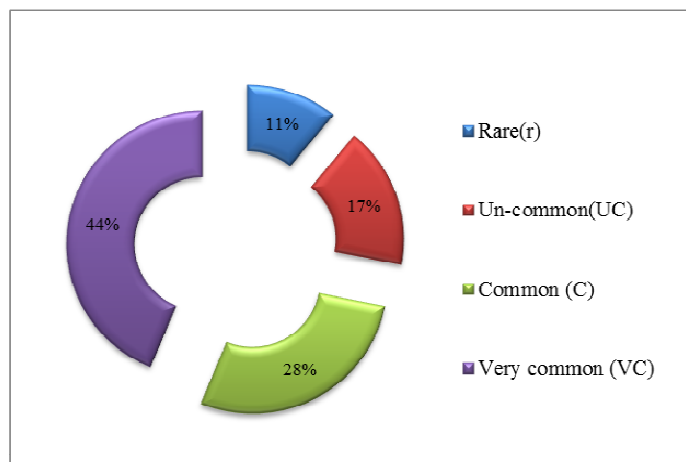


Figure-6
 Showing Status wise % of bird species available at selected sites

Conclusion

The study was conducted during three seasons at 6 different sampling sites. 64 species of birds belonging to 35 families and 13 Orders were identified at different selected sites along with their status. The study revealed that Shreewardhan taluka harbours rich bird diversity. Comparing the availability of bird species at Western Ghats(540) Shreewardhan (64) has about 12% of bird diversity observed during the study.

The sites with less abundance of bird species are greatly influenced by human activities include hunting, over-crowding, modification of habitats as a result of agricultural and industrial practices, developmental projects such as establishment of ports and the process of urbanization have been responsible for changes in bird population and habitats.

References

1. Chilke Arun M., 'Avian Diversity in and around Bamanwada Lake of Rajura, District Chandrapur Maharashtra', *Annals of Biological Research*, 3(4), 2014-2018, (2012) (<http://scholarsresearchlibrary.com/archive.html>)
2. Grimmett R., Inskipp C. and Inskipp T., Pocket guide to the Birds of Indian subcontinent, Oxford university press, New Delhi, (1999)
3. Colin Bibby, Martin Jones and Stuart Marsden, Expedition Field Techniques Bird surveys, Published by Bird Life International, (2000)
4. Padmavati A., Alexander R. and Anbarashan M., *Our Nature*, 8, 247-253, (2010)
5. Bhattacharjee P.C. and Hazarika B.C., Roosting sites and roosting birds at Gauhati Muncipal area, Second international symposium on life sciences., NEHU Shillong, (1985)

6. Sharma K.K. and Saini Minakshi, Community Structure and Population Dynamics of Aquatic Avifauna of Gharana Wetland (Reserve), Jammu, India, *International Research Journal of Biological Sciences*, **3(2)**, 1-8, (2014)
7. Kumar P. and Gupta S.K., *Our Nature*, **7**, 212- 217, (2009)
8. Nitsure S.R., 'Study of avifauna at Thane creek near Rituchakkra nature park'. *Master's thesis submitted to the Indian Institute of Ecology and Environment, New Delhi*, (2002)
9. Susanthkumar C., Birds of Shendurney Wildlife Sanctuary –Kerala, *Newsl. Birdwatchers*, **37**, 94-96, (1997)
10. Sanjay G.S., An ecological study of birds at Kokkare Bellur. WWF-India, New Delhi', *Final Report* (1993)
11. Kishori Sinnarkar, Abhay S. Hule, Rishikesh S. Dalvi and Vanita Kamath 'Avian diversity in Mahim Bay, Mumbai.' , *National Conference on Biodiversity : Status and Challenges in Conservation - 'FAVEO'*, 25-27, (2013)
12. Chhetry DT. *Nature*, **4**, 91-95 (2006)
13. Satish Pande, Anand Padhye, Pramod Deshpande, Aditya Ponshe, Amit Pawashe, Shivkumar Pednekar, Rohan Pandit, Pranav Pandit and Prashant Deshpande 'Avian collision threat assessment at 'Bhambarwadi Wind Farm Plateau' in northern Western Ghats, India', *Journal of Threatened Taxa*, **5(1)**, 3504–3515, (2013)
14. Pawar P.R., 'Species diversity of birds in mangroves of Uran (Raigad), Navi Mumbai, Maharashtra, West coast of India, *Journal of Experimental Sciences*, **2(10)** 73-77, (2011)
15. Quadros G., Study of inter-tidal fauna of Thane Creek, Ph.D Thesis, University of Mumbai, (2001)
16. Walmiki N., Karangutkar S., Yengal B., Pillai R., Ajaonkar P., Singh N. and Sagre P., Avian diversity in and around Bassein Fort and Creek, Dist. Thane, Maharashtra, *International Journal of Advanced Research*, **1(3)**, 73-85, (2013)
17. Verma A., Balachandran S., Charturvedi N. and Patil V., A preliminary report on the biodiversity of mahul creek, Mumbai, India with special reference to avifauna, *Zoo's Print journal*, **19(9)**, 1599-1605, (2003)
18. Rudra Narayan Pradhan, Udit Pratap Das, Rajesh Kumar Mohapatra and Arun Kumar Mishra, Checklist of Birds in and Around Ansupa Lake, Odisha, India, *International Research Journal of Biological Sciences*, **2(11)**, 9-12, (2013)
19. J. Praveen and P.O. Nameer, Monitoring bird diversity in Western Ghats of Kerala, *Current Science*, **96(10)**, 1390-95 (2009)
20. Praveen J. and Nameer P.O., A checklist of birds of Nelliampathy Hills, southern Western Ghats, *Zoo's Print J.*, **22**, 2695–2701 (2006)
21. Praveen J. and Nameer P.O., Bird diversity of Siruvani and Muthikulam Hills, Western Ghats, Kerala, *Indian Birds*, **3**, 210–217, (2008)
22. T.V. Ramachandra and A. Suja, Sahyadri: Western Ghats Biodiversity Information System, <http://ces.iisc.ernet.in/biodiversity.>, (2008)
23. Ali S. and Ripely S.D., Oxford University Press, Delhi, (1987)
24. Ali S., and Ripley S.D., A Pictorial Guide to the Birds of Indian subcontinent, 2nd Edition (Updated). B.N.H.S. and Oxford University Press, (1995)
25. Ali S. The book of Indian Birds, (revised, 13th edition) Bombay Natural History Society. (2002)