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COMMUNICATION

BIRD DIVERSITY IN THE COASTAL TALUKAS OF SINDHUDURG DISTRICT, MAHARASHTRA, INDIA

Golusu Babu Rao, Santhanakrishnan Babu, Goldin Quadros & Vijaykumar Anoop

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BIRD DIVERSITY IN THE COASTAL TALUKAS OF SINDHUDURG DISTRICT, MAHARASHTRA, INDIA

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Golusu Babu Rao¹ , Santhanakrishnan Babu² , Goldin Quadros³ 
& Vijaykumar Anoop⁴ 

PLATINUM
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^{1,2,3,4} Sálim Ali Centre for Ornithology and Natural History, Anaikatty, Coimbatore, Tamil Nadu 641108, India.

¹ Manipal Academy of Higher Education, Madhav Nagar, Manipal, Karnataka 576104, India.

¹ rao.3in@gmail.com, ² sanbabs@gmail.com (corresponding author), ³ goldinq@gmail.com, ⁴ pvanoop1@gmail.com

Abstract: The list of birds of Sindhudurg coastal district was compiled based on primary and secondary information. All observations were made along the Sindhudurg coast, i.e., from Terekhol to Vijaydurg. Wetland birds were recorded during sampling while terrestrial birds were recorded opportunistically. Besides, we also collated bird occurrence records from published literature (including grey literature and online resources) to prepare a comprehensive list of birds for Sindhudurg coast. During our study, we recorded 283 species, and 24 more species were compiled from secondary sources. Altogether, 307 species belonging to 78 families and 22 orders were recorded from the Sindhudurg coast. Order Passeriformes was dominant with 111 species. Among the 307 species, four species are endemic to the Western Ghats. Three species of vultures had been reported earlier but two were not encountered in recent years. Great Knot (EN), Woolly-necked Stork (VU) and 14 other species (NT) fall under various threat categories of IUCN. Species richness was higher in Vengurla (256) followed by Malvan (247) and Devgad talukas. Construction of homestays, unregulated tourism in coastal areas, and conversion of natural habitats to meet increasing tourism are the major threats to the coastal avifauna of the district. A high species richness of birds in Sindhudurg coast is attributed to the availability of a wide array of habitats (coastal to woodlands with different degrees of anthropogenic disturbances). Considering the high species richness of birds and livelihood dependency of humans on the coastal zones, a few estuaries namely Mochamad, Karli and Mitbav estuaries may be recognized as community/ conservation reserve to manage the ecosystem sustainably for long-term conservation of these estuaries and sub-habitats therein. Also, those sites can be perceived as Important Bird and Biodiversity Areas of IBCN as they fulfill the IBA criteria.

Keywords: Avifauna, conservation, laterite grasslands, Sindhudurg, Vengurla rocks.

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Author details: Golusu Babu Rao - my passion for wildlife is observing birds and understanding their behaviour in its natural environment. I am also interested in studying habitat use patterns of birds in changing landscape. Santhanakrishnan Babu - my research focuses on ornithology, landscape ecology, and Remote Sensing & GIS. Goldin Quadros - I am interested in the benthic invertebrates from wetland ecosystems. Anoop Vijay Kumar - my research involves different taxa such as birds and mammals and I have a special interest on Environmental Impact Assessment works.

Author contribution: SB, GBR and GQ conceived and designed the manuscript. GBR and AV conducted field surveys and data collection. GBR, AV and SB led the writing of the manuscript with inputs from GQ. All the authors equally contributed in refining the manuscript drafts and approved the final version.

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INTRODUCTION

Sindhudurg District is located geographically on the southwestern side of the state of Maharashtra and recognised as one of the principal tourist destinations in the western coast of India. The increasing inflow of tourists to Sindhudurg coast and subsequent change in land use and land cover of the coastal area increase the pressure on coastal and marine biodiversity. Due to its potential for over-exploitation of coastal biodiversity, MoEF&CC and the Maharashtra Forest Department – Mangrove Cell in collaboration with UNDP and GEF have initiated the Sindhudurg project to mainstream coastal biodiversity into a production sector. As part of the program, we compiled primary and secondary bird occurrence data along the Sindhudurg coasts to signify bird diversity wealth and to identify crucial bird areas for the conservation of coastal birds.

Southwestern Maharashtra (Ratnagiri and Sindhudurg) received much attention for bird studies from both the early-time British ornithologists and post-independence workers. Studies in Sindhudurg District can broadly be grouped into three categories based on the extent of focal area and target birds, viz., Sindhudurg District as a landscape level (Vidal 1980; Gole 1994; Prasad 2006; Mahabal et al. 2011), small regions or localities level (Hume 1876; Abdulali 1940, 1942, 1983; Madsen 1988; Pande 2002a; Lainer 2003; Katdare et al. 2004a; Patil 2015) and single or small group of birds level (Katdare 2001; Pande 2001, 2002b; Pande et al. 2001; Katdare et al. 2004b; Mahabal et al. 2007; Kambale et al. 2011; Rao et al. 2015). Vidal (1880) prepared the first comprehensive checklist on the birds of the Konkan region that included Sindhudurg District. Prasad (2006) included the Sindhudurg coast in his book on birds of western Maharashtra, though he did not specifically cover their local status. Studies by Khot (2016) included Malvan and Malagaon-Bagayat from Sindhudurg District but did not cover large parts of coastal zones in the Sindhudurg District. Patil et al. (2015) published a checklist for a single wetland (Pat Lake) in the district.

Considering this information and significance of the Sindhudurg coast, we have attempted to assess the local status, habitat association, sighting frequency and taluka-wise distribution of birds from the coastal talukas of Sindhudurg District based on primary and secondary observations from this region.

STUDY AREA

Sindhudurg District (15.37–16.40 °N & 73.19–74.18 °E) is located geographically on southwestern Maharashtra, and it was carved out from the erstwhile Ratnagiri District in 1981. The terrain is mostly gently undulating, and the elevation ranges from sea level to 120m. The state of Goa borders it in the south, Ratnagiri District in the north, Kolhapur District in the east and the Arabian Sea in the west (Fig. 1). Out of eight talukas, Vengurla, Malvan, and Devgad are coastal talukas. Coastal stretches of the district hold a wide-array of natural habitats, viz., sandy intertidal mudflats, mangroves, sandy beaches, rocky shoreline, and wooded forests. The coasts of Malvan Taluka has been recognized as Malvan Marine Wildlife Sanctuary in 1987. In addition to the coastal areas, we also did a survey at Pat Lake (freshwater lake), laterite grasslands (Chipi, Tondavali, Vengurla and other small grasslands), woodland areas within this buffer (moist deciduous forests and plantations), Vengurla rocks/islands (located nearly 6km from the coast), and man-modified sites (agriculture fields, saltpan and aquaculture ponds) (Images 1 & 2).

Pat Lake: Pat Lake is a freshwater lake located amid populated Pat Parule Village in Vengurla Taluka. This shallow lake with floating vegetation and mature trees on one side makes it a suitable habitat for several water-associated birds including ducks and geese. Agricultural fields and a road surround the lake.

Laterite grasslands: These grasslands were formed during the mid-tertiary period and are part of Deccan Trap floodplain (Seshadri et al. 2016). The overall habitat comprises grasses, herbs, shrubs and stunted trees interspersed with agricultural fields and habitation. Grasslands are found along the coastal areas of Sindhudurg District. Some of the meadows are extensive in size and, offer potential foraging ground for raptors (e.g., Harriers *Circus* sp.) and nesting ground for grassland birds (e.g., Lapwings *Vanellus* sp. and Larks *Alaudidae*). We selected Chipi, Tondavali, Vengurla and other small grasslands in these talukas for studying raptor and other grassland dependent birds.

Woodlands including plantations: Fragmented patches of moist deciduous forest and plantations (mango, coconut, cashew and *Casuarina*) are found in mosaics among the human settlements. The natural forests are not intact but possess dense upper-storey and mid-storey cover.

Vengurla rocks: It is a group of small rocky offshore islands located around six kilometres from the Kochara

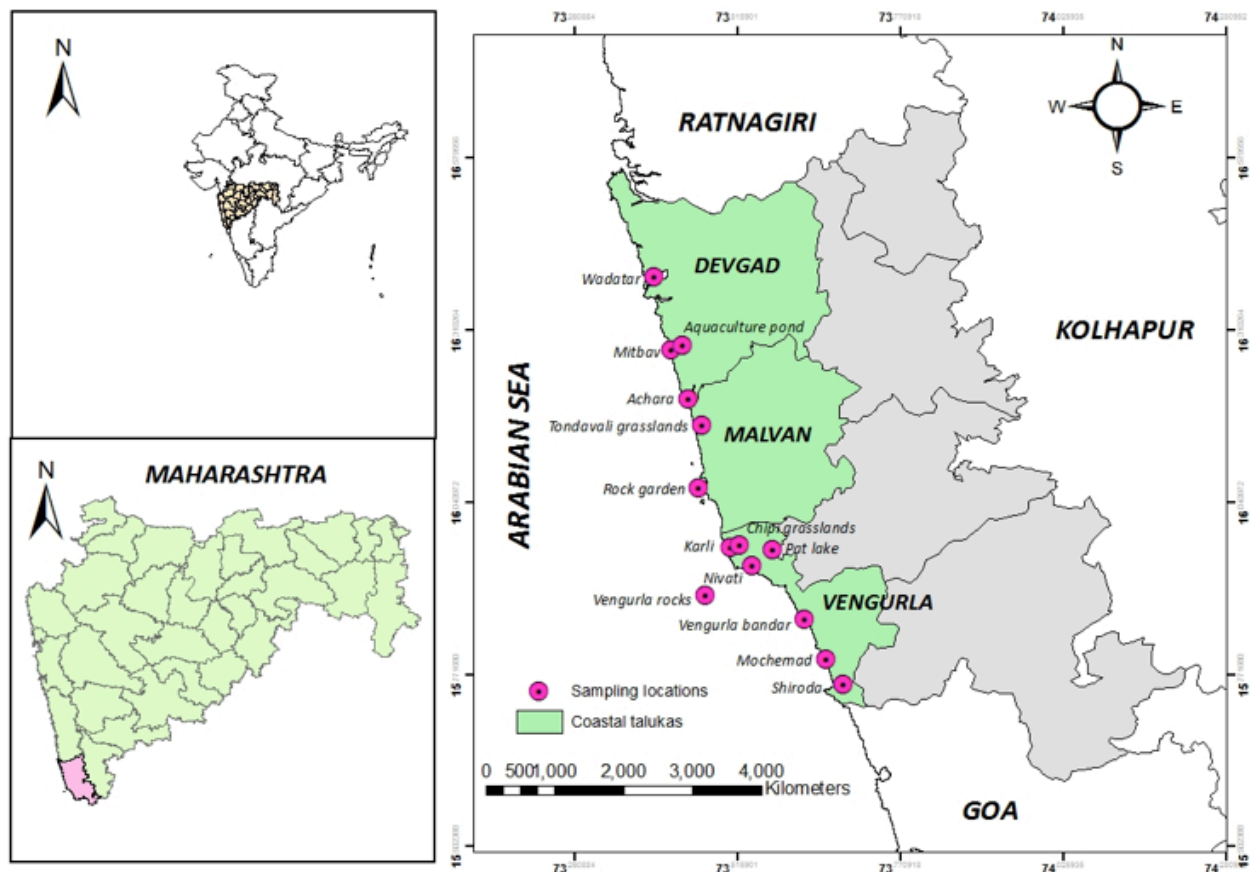


Figure 1. Bird sampling locations in Sindhudurg coast.

village in Vengurla Taluka. In one of the islets, breeding activities of the Greater Crested Tern *Thalasseus bergii*, Bridled Tern *Onychoprion anaethetus* and Roseate Tern *Sterna dougallii* have been reported (Lainer 2003). This rocky islet is partially covered with combinations of tall grasses and short herb species. The terns exploit the bare rocky portions of the island for nesting.

Man-modified habitats: Modified wetlands such as agriculture fields (largely paddy), saltpans and aquaculture ponds are found in patches throughout the coastal areas. Saltpan is practised in Vengurla Taluka on a minor scale. Aquaculture ponds are common along upstream regions of the district. Common aquaculture taxa are prawns and crabs.

MATERIALS AND METHODS

We chose seven estuaries/creeks: Achara and Karli in Malvan Taluka, Mitbav and Wadatar in Devgad Taluka, and Mochemad, Vengurla Bandar and Nivati in Vengurla Taluka for observing the coastal birds (Fig. 1).

These sites were sampled once a month and thus, we visited the whole stretch of Sindhudurg coast either by bike or jeep covering diverse terrestrial habitats (moist deciduous, grasslands, agriculture fields, commercial plantations) and inland wetland habitats (Pat Lake and puddles in grasslands during the monsoon) in the area. All observations on terrestrial birds were opportunistic. Quantitative data was collected only for wetland birds, which were the focus of the project but we recorded other birds as well to make a comprehensive list of birds. Bird surveys were carried out from December 2014 to December 2016. We made observations between 05.30h and 18.00h and conducted occasional night surveys for owls *Strigiformes*. Besides, we also conducted four offshore surveys to Vengurla rocks for pelagic birds using fishing boats. The number of days spent at each field site and taluka is provided in (Table 1). Although we used the Nikon spotting scope 20–60x for bird observation, sufficient photographs were taken to confirm species identities. Nearly 80% of our observations were photo documented. We did not collect abundance data for the terrestrial birds; thus, we categorised all the birds

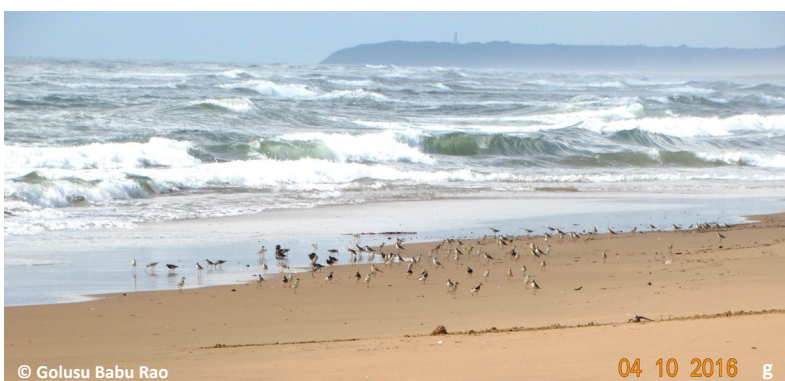


Image 1 . Natural habitats surveyed in Sindhudurg coast: a—Intertidal sandy mudflat | b—Mangroves | c—Rocky shore | d—Vengurla rocks | e—Pat lake | f—Laterite grasslands | g—Sandy beach.



Image 2. Man-modified habitats in Sindhudurg coast: a—Aquaculture pond | b—Agriculture lands | c—Saltpan.

into three broad categories based on the percentage of sighting such as >3% (Common), 1–3 % (uncommon) and <1% (rare). The percentage of sightings were expressed by dividing frequency of sightings of particular species by total visits. We referred Birdlife International (2019) for threat status of each species.

On the basis of our observation from December 2014

to December 2016 in the district, the distribution status of each bird species was categorized into five groups.

Resident: Occurs in the district throughout the year.

Winter Migrant: Species occur only during winter (September to May).

Passage Migrant: Species occurs in the study area for refueling their energy during onward and return migration.

Vagrant: Species is either not resident/not regular breeding or wintering migrant but has a few stray records.

Monsoon Migrant: Species occurs only during the monsoon.

RESULTS

We collated 307 species belonging to 78 families, and 22 orders for the coastal areas of Sindhudurg District (Table 2) and 283 species recorded during our survey, and 24 more species compiled from the published literature. During this study, species richness was the highest in Vengurla Taluka (256 species) followed by Malvan Taluka (247), and Devgad Taluka (213) (Table 2). Order Passeriformes (111 species) had the highest species representation followed by Charadriiformes (63), Accipitriformes (20) and Pelecaniformes (15) and one species each represented in Procellariiformes and Gaviiformes (Fig. 2). Out of 283 species, 175 (~62%) and 108 (~38%) were resident and migratory birds respectively. Among 108 migrants, 93 winter migrants, 13 passage migrants, one monsoon migrant and one vagrant were recorded.

Sindhudurg coast used to support three Critically Endangered species namely Red-headed Vulture *Sarcogyps calvus*, White-rumped Vulture *Gyps bengalensis*, and Indian Vulture *G. indicus*, one Endangered Great Knot *Calidris tenuirostris*, and Vulnerable Woolly-necked Stork *Ciconia episcopus* but during our study we could not record any vultures (Table 2 & Image 3). The vulture population has crashed all over the country. Besides, 14 more species fall under the Near Threatened category of IUCN. Grey-headed Bulbul *Pycnonotus priocephalus*, Malabar Grey Hornbill *Ocyrceros griseus*, Crimson-backed Sunbird *Leptocoma minima*, and Vigor's Sunbird *Aethopyga vigorsii* are the birds recorded from the Sindhudurg coast that are considered to be endemic to the Western Ghats. Based on the sighting percentage, 151, 114 and 18 species were common, uncommon and rare, respectively. Location and date of observation of species sighted less than <1%

Table 1. Site and taluka wise sampling effort in Sindhudurg District.

	Taluka	Site	Number of days visited between December 2014-December 2016					Total effort
			Mar–May	Jun–Aug	Sep–Nov	Dec–Feb	Sub total	
1	Devgad	Vijaydurg	2	2	5	5	14	85
2		Phanse	1	1	1	2	5	
3		Kunkeshwar	1	2	2	1	6	
4		Mithmumbri	2	1	1	2	6	
5		Wadatar	7	5	6	9	27	
6		Mitbav	7	6	5	9	27	
7	Malvan	Achara	7	5	5	10	27	87
8		Tondavali grassland	1	2	6	2	11	
9		Rock Garden	8	4	4	8	24	
10		Tarkarli	7	5	5	8	25	
11	Vengurla	Karli	7	5	5	8	25	157
12		Chipi grassland	2	3	3	3	11	
13		Nivati	8	5	5	8	26	
14		Pat Lake	3	3	2	4	12	
15		Vengurla Bandar	7	5	5	10	27	
16		Mochemad	8	5	5	9	27	
17		Shiroda salt pans	7	5	5	8	25	
18		Vengurla rocks	-	-	4	-	4	
		Total	85	64	74	106	329	329

of total visits are given below (Image 3).

INTERESTING SIGHT RECORDS

Northern Shoveler *Anas clypeata*: It was recorded twice: once in an aquaculture pond of Mitbav on 6 November 2016, and another on 8 November 2016 at Shiroda salt pans of Vengurla. On both occasions, the flock size was >10.

Ruddy Shelduck *Tadorna ferruginea*: One bird was seen in an aquaculture pond at Mitbav on 6 November 2016.

Painted Stork *Mycteria leucocephala*: A sub-adult bird was seen in a salt pan at Shiroda on 22 January 2015 (Image 3).

Amur Falcon *Falco amurensis*: One bird was seen in grassland at Vengurla on 20 November 2015 (Image 3).

Common Buzzard *Buteo buteo*: We recorded it three times: one individual each at Vijayadurg and Kochara beach on 22 October 2015, and three individuals at Kochara beach on 10 October 2016.

Masked Booby *Sula dactylatra*: Three sub-adults were seen resting on rocky islets close to Vengurla rocks on 7 October 2015 (Image 3).

Eurasian Oystercatcher *Haematopus ostralegus*: We

saw it twice: two birds on 8 October 2016 at Tambaldeg beach, and a solitary bird was observed on 11 July 2016 at Devbag beach.

Crab-plover *Dromas ardeola*: A bird was observed in mixed flocks of gulls at Mochemad beach on 7 November 2016 (Image 3).

Great Knot *Calidris tenuirostris*: Two birds were seen on mudflats of Mochemad estuary on 6 November 2016.

Ruff *Philomachus pugnax*: A sparse flock of 10 birds were seen at Tondavali laterite grasslands on 18 September 2015 (Image 3).

Black-tailed Godwit *Limosa limosa*: This solitary bird was seen twice at Shiroda salt pans, first on 5 January 2015 and the second on 28 March 2016.

Bar-tailed Godwit *Limosa lapponica*: One individual was sighted on 28 October 2016 at Mitbav aquaculture pond (Image 3).

Great Thick-knee *Esacus recurvirostris*: The solitary bird was observed in the intertidal mudflat of Vengurla Bandar on 26 December 2016 (Image 3).

Oriental Pratincole *Glareola maldivarum*: A pair was sighted in Tondavali grasslands on 20 August 2016. Tentatively identified as Oriental Pratincole after examining the wing pattern visible in the videos we took

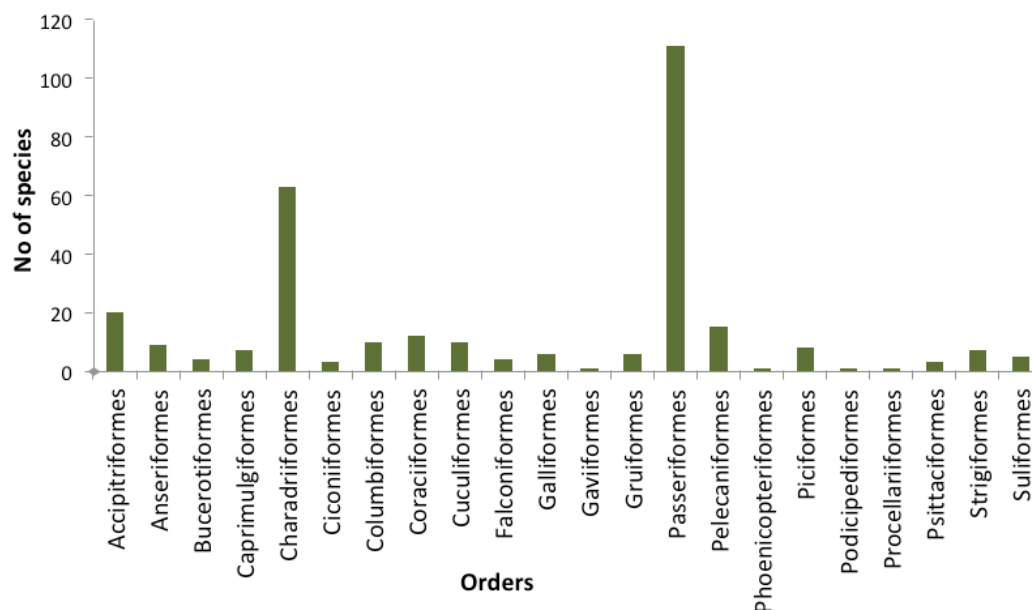


Figure 2. Species richness of birds in different orders.

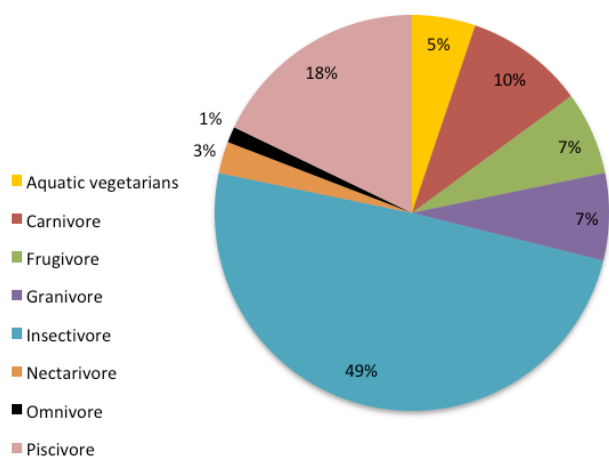


Figure 3. Species composition of birds in different foraging guilds.

Although we observed Steppe Eagle *Aquila nipalensis*, Grey-headed Fish Eagle *Ichthyophaga ichthyaetus*, Indian Spotted Eagle *A. hastata*, Red-necked Falcon *Falco chicquera*, Eurasian Sparrowhawk *Accipiter nisus* and Common Ringed Plover *Charadrius hiaticula* during our study, due to a lack of good quality photographs we excluded them from the list. The foraging guild of birds species in the district was dominated by insectivores (~49%) followed by piscivores (~18%), and omnivores and nectarivores showed least contribution (1% to 3%) (Fig. 3).

DISCUSSION

Altogether, we collated 307 species from Sindhudurg coast, which represents nearly 84% of birds recorded from the Sindhudurg District as a whole (eBird 2019). Out of these 307 species, four are endemic to the Western Ghats. A multi-observer effort of 997 and 838 eBird lists yielded 364 and 340 bird species in Sindhudurg and Ratnagiri districts respectively while the present study recorded 283 bird species from 329 field days in the coastal areas indicating the high diversity of birds in these talukas. Despite inadequate sampling effort in the Western Ghats, year-round monitoring along the Sindhudurg coast raised the total species pool. A few stretches of natural forests (for example moist deciduous forests) in the district were surveyed, but intensive sampling was not conducted. Accordingly, the

(Video 1) (Gerald Driessens in litt. 8 August 2018).

Wilson’s Storm-petrel *Oceanites oceanicus*: A single bird was seen foraging actively in the open sea on 23 October 2015 between Nivati beach and Vengurla rocks

Common Tern *Sterna hirundo*: During our offshore surveys between Nivati beach and Vengurla rocks on 23 October 2015 four individuals were observed at Burnt Island.

Little Tern *Sternula albifrons*: The solitary bird was seen in Shiroda saltpans on 12 March 2015.

Brown-breasted Flycatcher *Muscicapa muttui*: Observed one individual in wooded areas of Karli village on 19 October 2016.

Table 2. Birds from three coastal talukas of Sindhudurg District, Maharashtra

	Common name	Scientific name	Observers	Status	Occurrence	Talukas			Habitats used
						Vengurla	Malvan	Devgad	
	Galliformes/ Phasianidae								
1	Indian Peafowl	<i>Pavo cristatus</i>	P, K	R	C	+	+	+	GS
2	Grey Junglefowl	<i>Gallus sonneratii</i>	P	R	U	+	+	-	WD
3	Red Spurfowl	<i>Galloperdix spadicea</i>	P, V	R	U	+	+	-	WD
4	Grey Francolin	<i>Francolinus pondicerianus</i>	P	R	C	+	+	+	GS,WD
5	Common Quail	<i>Coturnix coturnix</i>	P	W	U	+	-	-	GS,WD
6	Jungle Bush Quail	<i>Perdica asiatica</i>	P, V, K	R	U	+	-	+	GS,WD
	Charadriiformes/ Turnicidae								
7	Barred Buttonquail	<i>Turnix suscitator</i>	P, V, K	R	U	-	+	-	GS
	Anseriformes/ Anatidae								
8	Lesser Whistling-duck	<i>Dendrocygna javanica</i>	P, K	R/LM	C	+	+	+	FW, AQ, SAL
9	Cotton Pygmy-goose	<i>Nettapus coromandelianus</i>	P	R/LM	C	+	-	-	FW
10	Indian Spot-billed Duck	<i>Anas poecilorhyncha</i>	P	R/LM	C	+	-	-	FW
11	Northern Pintail	<i>Anas acuta</i>	P	W	U	+	-	-	FW
12	Garganey	<i>Spatula querquedula</i>	P	W	U	+	-	-	FW, AQ, SAL
13	Common Teal	<i>Anas crecca</i>	P	W	U	+	-	+	FW, AQ, SAL, MG
14	Gadwall	<i>Anas strepera</i>	P	W	U	+	-	+	FW, AQ, SAL, MG
15	Northern Shoveler	<i>Anas clypeata</i>	P	W	R	+	+	+	FW, AQ, SAL
16	Ruddy Shelduck	<i>Tadorna ferruginea</i>	P	W	R	-	-	+	FW, AQ
	Podicipediformes/ Podicipedidae								
17	Little Grebe	<i>Tachybaptus ruficollis</i>	P, V, K	R/LM	C	+	+	+	FW, SAL
	Phoenicopteriformes/ Phoenicopteridae								
18	Greater Flamingo	<i>Phoenicopterus roseus**</i>	A	Unknown	Unknown	-	+	-	INMDF
	Ciconiiformes/ Ciconiidae								
19	Painted Stork	<i>Mycteria leucocephala</i>	P	W	R	+	-	-	AQ
20	Asian Openbill	<i>Anastomus oscitans</i>	P	W	C	+	+	+	FW, MG, AG
21	Woolly-necked Stork	<i>Ciconia episcopus</i>	P	R/LM	C	+	-	-	SBH, AQ, SAL
	Pelecaniformes/ Threskiornithidae								
22	Black-headed Ibis	<i>Threskiornis melanocephalus</i>	P	R/LM	C	+	+	+	FW, AG, MG, AQ, SAL
23	Glossy Ibis	<i>Plegadis falcinellus</i>	P	W	U	+	-	-	FW, AG, AQ
24	Red-naped Ibis	<i>Pseudibis papillosa</i>	P	R/LM	U	+	-	-	FW, AG, AQ
	Pelecaniformes/ Ardeidae								
25	Cinnamon Bittern	<i>Ixobrychus cinnamomeus</i>	P, V	R/LM	U	-	+	-	GS, MG
26	Yellow Bittern	<i>Ixobrychus sinensis</i>	P	R/LM	U	+	-	-	MG, VGR
27	Cattle Egret	<i>Bubulcus ibis</i>	P, K	R/LM	C	+	+	+	FW, MG, AQ, SAL, RSH, SBH, GS, AG
28	Little Egret	<i>Egretta garzetta</i>	P, K	R/LM	C	+	+	+	FW, MG, AQ, SAL, AG, RSH
29	Intermediate Egret	<i>Mesophoyx intermedia</i>	P, K	R/LM	C	+	+	+	FW, MG, AQ, SAL, AG
30	Great Egret	<i>Casmerodius albus</i>	P, K	R/LM	C	+	+	+	FW, MG, AQ, SAL, AG, RSH

	Common name	Scientific name	Observers	Status	Occurrence	Talukas			Habitats used
						Vengurla	Malvan	Devgad	
31	Western Reef Egret	<i>Egretta gularis</i>	P, A, K, L	W	C	+	+	+	FW, MG, AQ, SAL, RSH, SBH
32	Grey Heron	<i>Ardea cinerea</i>	P, A, K	W	C	+	+	+	FW, MG, AQ, SAL, INMDF
33	Purple Heron	<i>Ardea purpurea</i>	P, K	R/LM	C	+	+	+	FW, MG, AQ, SAL
34	Indian Pond Heron	<i>Ardeola grayii</i>	P, K, L	R/LM	C	+	+	+	FW, MG, AQ, SAL, AG, RSH, INMDF
35	Striated Heron	<i>Butorides striata</i>	P, V, K	R	C	+	+	+	FW, MG, RSH, SAL, AQ
36	Black-crowned Night Heron	<i>Nycticorax nycticorax</i>	P, V, K	R	U	+	+	-	FW
	Suliformes/ Anhingidae								
37	Darter	<i>Anhinga melanogaster</i>	P	W	U	+	+	-	MG, AQ
	Suliformes/ Phalacrocoracidae								
38	Little Cormorant	<i>Phalacrocorax niger</i>	P, K	R/LM	C	+	+	+	FW, MG, AQ, SAL
39	Indian Cormorant	<i>Phalacrocorax fuscicollis</i>	P	W	U	+	+	+	FW, MG, AQ, SAL
	Suliformes/ Sulidae								
40	Masked Booby	<i>Sula dactylatra</i>	P	V	R	+	+	-	VGR
41	Brown Booby	<i>Sula leucogaster**</i>	J	Unknown	Unknown	+	-	-	OFSH
	Falconiformes/ Falconidae								
42	Common Kestrel	<i>Falco tinnunculus</i>	P, H, V, L, PKT, K	W	C	+	+	+	GS, VGR
43	Peregrine Falcon	<i>Falco peregrinus calidus</i>	P, V, A, L	W	C	+	+	+	SBH, PL
44	Amur Falcon	<i>Falco amurensis</i>	P	PM	R	+	-	-	GS
45	Eurasian Hobby	<i>Falco subbuteo</i>	P	W	U	+	-	-	GS
	Accipitriformes/ Pandionidae								
46	Osprey	<i>Pandion haliaetus</i>	P, V, A, L	W	C	+	+	+	GS, SBH, MG, INMDF, AQ, SAL, VGR
	Accipitriformes/ Accipitridae								
47	Red-headed Vulture	<i>Sarcogyps calvus**</i>	V	Unknown	Unknown	-	+	-	WD
48	White-rumped Vulture	<i>Gyps bengalensis**</i>	V, KM	Unknown	Unknown	+	+	+	WD
49	Indian Vulture	<i>Gyps indicus**</i>	V	Unknown	Unknown	+	+	+	WD
50	Black Kite	<i>Milvus migrans</i>	P, K	R/LM	C	+	+	+	GS, SBH, RSH, MG, INMDF, AQ, SAL, WD
51	Brahminy Kite	<i>Haliastur Indus</i>	P, L, K	R	C	+	+	+	GS, SBH, RSH, MG, INMDF, AQ, SAL, WD
52	Black-winged Kite	<i>Elanus caeruleus</i>	P	R	C	+	+	+	GS, AQ, WD, AG
53	White-bellied Sea Eagle	<i>Haliaeetus leucogaster</i>	P, H, A, PKT, PA, KMP, L, KT	R	C	+	+	+	GS, SBH, RSH, INMDF, AQ, SAL, MG, WD, VGR
54	Crested Serpent Eagle	<i>Spilornis cheela</i>	P, V, K	R	C	+	+	+	GS, AQ, MG, WD
55	Eurasian Marsh Harrier	<i>Circus aeruginosus</i>	P, V, L	W	C	+	+	+	FW, GS, MG
56	Pallid Harrier	<i>Circus macrourus</i>	P	W	U	+	+	+	GS
57	Montagu's Harrier	<i>Circus pygargus</i>	P	W	U	+	+	+	GS
58	Shikra	<i>Accipiter badius</i>	P, V, K	R	C	+	+	+	GS, PL, AG, WD

	Common name	Scientific name	Observers	Status	Occurrence	Talukas			Habitats used
						Vengurla	Malvan	Devgad	
59	Besra	<i>Accipiter virgatus</i>	P	R	U	+	+	-	GS, WD
60	Oriental Honey-buzzard	<i>Pernis ptilorhynchus</i>	P	R	C	+	+	+	GS, PL, MG, VGR, WD
61	White-eyed Buzzard	<i>Butastur teesa</i>	P, K	R	U	+	+	+	GS, WD
62	Common Buzzard	<i>Buteo buteo</i>	P	PM	R	+	-	+	GS, WD
63	Bonelli's Eagle	<i>Aquila fasciata</i>	P	R	U	-	+	+	GS, WD
64	Booted Eagle	<i>Hieraaetus pennatus</i>	P	W	C	+	+	+	GS, SBH, MG
65	Crested Hawk Eagle	<i>Nisaetus cirrhatus</i>	P, K	R	C	+	+	+	GS, SBH, MG, PL, WD
	Strigiformes/ Tytonidae								
66	Barn Owl	<i>Tyto alba</i>	P	R	C	+	+	+	GS, WD
	Strigiformes/ Strigidae								
67	Indian Scops Owl	<i>Otus bakkamoena</i>	P, V, K	R	U	+	+	-	GS, WD
68	Brown Hawk Owl	<i>Ninox scutulata**</i>	V	Unknown	Unknown	-	+	-	GS, WD
69	Brown Wood Owl	<i>Strix leptogrammica**</i>	V	Unknown	Unknown	-	-	+	WD
70	Jungle Owlet	<i>Glaucidium radiatum</i>	P, V, K	R	C	+	+	+	GS, WD
71	Spotted Owlet	<i>Athene brama</i>	P, V	R	C	+	+	+	GS, WD
72	Brown Fish Owl	<i>Ketupa zeylonensis</i>	P	R	U	-	+	-	FW, GS
	Caprimulgiformes/ Caprimulgidae								
73	Jungle Nightjar	<i>Caprimulgus indicus</i>	P, V	R	C	+	+	+	WD, GS
74	Indian Nightjar	<i>Caprimulgus asiaticus</i>	P, V	R	U	+	+	+	WD, GS
75	Savanna Nightjar	<i>Caprimulgus affinis</i>	P, V	R	U	-	+	-	WD, GS
	Gruiformes/ Rallidae								
76	Slaty-legged Crake	<i>Rallina eurizonoides</i>	P	W	U	-	+	-	FW
77	Slaty-breasted Rail	<i>Gallirallus striatus</i>	P, V	R	U	+	+	-	MG
78	White-breasted Waterhen	<i>Amaurornis phoenicurus</i>	P, K	R	C	+	+	+	FW, MG, AQ, AG
79	Common Moorhen	<i>Gallinula chloropus</i>	P	R/LM	U	+	-	-	FW, SAL
80	Eurasian Coot	<i>Fulica atra</i>	P	R/LM	U	+	-	-	FW, SAL
81	Purple Swampphen	<i>Porphyrio porphyrio</i>	P, V	R/LM	C	+	+	-	FW
	Charadriiformes/ Jacanidae								
82	Pheasant-tailed Jacana	<i>Hydrophasianus chirurgus</i>	P, K	R/LM	C	+	+	-	FW
83	Bronze-winged Jacana	<i>Metopidius indicus</i>	P	R/LM	C	+	-	-	FW
	Charadriiformes/ Haematopodidae								
84	Eurasian Oystercatcher	<i>Haematopus ostralegus</i>	P	PM	R	-	+	+	SBH
	Charadriiformes/ Recurvirostridae								
85	Black-Winged Stilt	<i>Himantopus himantopus</i>	P, V	R	C	+	+	+	AQ, SAL
	Charadriiformes/ Dromadidae								
86	Crab-plover	<i>Dromas ardeola</i>	P	PM	R	+	-	-	SBH
	Charadriiformes/ Charadriidae								
87	Little Ringed Plover	<i>Charadrius dubius</i>	P, V, K	W	C	+	+	+	AQ, SAL, SBH, GS
88	Kentish Plover	<i>Charadrius alexandrinus</i>	P, V	W	C	+	+	+	SBH, INMDF, MG, AQ

	Common name	Scientific name	Observers	Status	Occurrence	Talukas			Habitats used
						Vengurla	Malvan	Devgad	
89	Lesser Sand Plover	<i>Charadrius mongolus</i>	P, V	W	C	+	+	+	SBH, INMDF, MG, AQ, SAL, GS, RSH
90	Greater Sand Plover	<i>Charadrius leschenaultii</i>	P	W	C	+	+	+	SBH, INMDF, MG, AQ
91	Pacific Golden Plover	<i>Pluvialis fulva</i>	P	W	C	+	+	+	SBH, INMDF, MG, AQ, SAL, GS, AG, RSH
92	Grey Plover	<i>Pluvialis squatarola</i>	P, V	W	U	+	+	+	SBH, AQ, SAL, INMDF
93	Yellow-wattled Lapwing	<i>Vanellus malabaricus</i>	P, V	R/LM	C	+	+	+	GS, AG
94	Red-wattled Lapwing	<i>Vanellus indicus</i>	P, K	R	C	+	+	+	MG, AQ, SAL, GS, AG, FW
	Charadriiformes/ Rostratulidae								
95	Greater Painted-snipe	<i>Rostratula benghalensis</i>	P	R	U	+	-	-	GS, AQ
	Charadriiformes/ Scolopacidae								
96	Ruff	<i>Philomachus pugnax</i>	P	PM	R	-	+	-	GS
97	Common Snipe	<i>Gallinago gallinago</i>	P, K	W	C	+	+	+	GS, AG, AQ
98	Black-tailed Godwit	<i>Limosa limosa</i>	P	PM	R	+	-		SAL
99	Bar-tailed Godwit	<i>Limosa lapponica</i>	P	PM	R	-	-	+	AQ, INMDF
100	Whimbrel	<i>Numenius phaeopus</i>	P, V	W	C	+	+	+	SBH, INMDF, MG, AQ, SAL, GS
101	Eurasian Curlew	<i>Numenius arquata</i>	P	W	C	+	+	+	SBH, INMDF, MG, AQ, GS
102	Common Redshank	<i>Tringa totanus</i>	P, K	W	C	+	+	+	SBH, INMDF, MG, AQ, SAL
103	Common Greenshank	<i>Tringa nebularia</i>	P	W	C	+	+	+	SBH, INMDF, MG, AQ, SAL, AG
104	Marsh Sandpiper	<i>Tringa stagnatilis</i>	P	W	U	+	+	+	AQ, SAL
105	Green Sandpiper	<i>Tringa ochropus</i>	P	W	U	+	+	+	AQ, SAL, GS, AG
106	Wood Sandpiper	<i>Tringa glareola</i>	P, K	W	C	+	+	+	AQ, SAL, GS, FW, AG
107	Terek Sandpiper	<i>Xenus cinereus</i>	P	W	C	+	+	+	SAT, SBH, INMDF, MG
108	Common Sandpiper	<i>Actitis hypoleucos</i>	P, A, PA, L, K	W	C	+	+	+	AQ, SAL, SBH, INMDF, MG, RSH, FW, GS, AG
109	Ruddy Turnstone	<i>Arenaria interpres</i>	P, V, A, G, KMP, PA, L	W	C	+	+	+	SBH, RSH, GS
110	Little Stint	<i>Calidris minuta</i>	P	W	C	+	+	+	AQ, SAL, SBH, INMDF, RSH, GS
111	Temminck's Stint	<i>Calidris temminckii</i>	P	W	C	+	+	+	AQ, SAL
112	Sanderling	<i>Calidris alba</i>	P, V	W	U	+	+	+	SBH, INMDF
113	Curlew Sandpiper	<i>Calidris ferruginea</i>	P, V	W	U	+	+	+	SBH, INMDF, AQ, SAL, RSH
114	Great Knot	<i>Calidris tenuirostris</i>	P	PM	R	+	-	-	INMDF, SBH
115	Broad-billed Sandpiper	<i>Limicola falcinellus</i>	P	W	U	+	+	+	SAT, SBH, INMDF
116	Dunlin	<i>Calidris alpina</i>	P	W	U	+	+	+	AQ, SAL, INMDF, SBH
	Charadriiformes/ Glareolidae								
117	Small Pratincole	<i>Glareola lacteal</i>	P	R/LM	U	+	-	-	ASL, SBH

	Common name	Scientific name	Observers	Status	Occurrence	Talukas			Habitats used
						Vengurla	Malvan	Devgad	
118	Oriental Pratincole	<i>Glareola maldivarum</i>	P	W	R	-	+	-	GS
	Charadriiformes/ Burhinidae								
119	Great Thick-knee	<i>Esacus recurvirostris</i>	P	R/LM	R	+	-	-	FW, INMDF
120	Indian Thick-knee	<i>Burhinus indicus**</i>	V	Unknown	Unknown	-	+	-	FW, GS
	Charadriiformes/ Laridae								
121	Pallas's Gull	<i>Ichthyaeetus ichthyaeetus</i>	P	W	C	+	+	+	SBH, OFSH, INMDF
122	Heuglin's Gull	<i>Larus heuglini</i>	P, V, L	W	C	+	+	+	SBH, OFSH, RSH, INMDF
123	Steppe Gull	<i>Larus barabensis</i>	P	W	U	+	+	+	SBH, OFSH, INMDF
124	Slender-billed Gull	<i>Chroicocephalus genei</i>	P	W	C	+	+	+	SBH, OFSH, INMDF
125	Brown-headed Gull	<i>Chroicocephalus brunnicephalus</i>	P, V, A, L	W	C	+	+	+	SBH, OFSH, INMDF, RSH
126	Black-headed Gull	<i>Chroicocephalus ridibundus</i>	P, G, L	W	C	+	+	+	SBH, OFSH, INMDF, RSH
127	Gull-billed Tern	<i>Gelochelidon nilotica</i>	P	W	C	+	+	+	SBH, INMDF
128	Lesser Crested Tern	<i>Thalasseus bengalensis</i>	P, V, A, L, VK, KMP, KD	W	C	+	+	+	SBH, INMDF, VGR
129	Greater Crested Tern	<i>Thalasseus bergii</i>	P, V, A, M, VK, PA, KMP, L	R	C	+	+	+	SBH, INMDF, VGR
130	Caspian Tern	<i>Hydroprogne caspia</i>	P, A, L	W	U	+	+	+	SBH, INMDF
131	Sandwich Tern	<i>Thalasseus sandvicensis</i>	P, G, L	W	U	+	+	+	SBH, INMDF
132	River Tern	<i>Sterna aurantia</i>	P, PA	R/LM	U	+	-	-	FW
133	Little Tern	<i>Sternula albifrons</i>	P, A, G	R/LM	R	+	+	-	FW, SAL
134	Roseate Tern	<i>Sterna dougallii</i>	P, H, A, VK, PA, KMP, L	R/LM	U	+	-	-	VGR
135	Common Tern	<i>Sterna hirundo</i>	P, PA, L	W	R	-	+	-	OFSH
136	Whiskered Tern	<i>Chlidonias hybrida</i>	P	W	U	+	+	+	AQ, SAL, INMDF, SBH
137	White-cheeked Tern	<i>Sterna repressa**</i>	V, M, PA, L	Unknown	Unknown	+	+	-	OFSH
138	Sooty Tern	<i>Onychoprion fuscatus</i>	P, A, M, PA, L	PM	U	+	-	+	OFSH
139	Bridled Tern	<i>Onychoprion anaethetus**</i>	V, A, M, VK, PA, KMP, L	Unknown	Unknown	+	-	-	VGR, OFSH
140	Brown Noddy	<i>Anous stolidus**</i>	L	Unknown	Unknown	+	-	-	OFSH
	Charadriiformes/ Scolariidae								
141	Brown Skua	<i>Stercorarius antarcticus**</i>	ED	Unknown	Unknown	-	+	-	OFSH
142	Arctic Skua	<i>Stercorarius parasiticus**</i>	L	Unknown	Unknown	+	-	-	OFSH
143	Pomarine Skua	<i>Stercorarius pomarinus**</i>	PA	Unknown	Unknown	+	-	-	OFSH
	Procellariiformes/ Oceanitidae								
144	Wilson's Storm-petrel	<i>Oceanites oceanicus</i>	P	PM	R	+	-	-	OFSH
	Gaviiformes/ Gaviidae								
145	Red-throated Diver	<i>Gavia stellata**</i>	AV	Unknown	Unknown	-	-	+	OFSH
	Columbiformes/ Columbidae								
146	Common Pigeon	<i>Columba livia</i>	P, H, V, A, PKT, PA, KMP, L MP, K	R	C	+	+	+	WD, GS, VGR
147	Laughing Dove	<i>Stigmatopelia senegalensis</i>	P	R	C	+	+	+	WD, GS
148	Spotted Dove	<i>Stigmatopelia chinensis</i>	P, K	R	C	+	+	+	WD, GS

	Common name	Scientific name	Observers	Status	Occurrence	Talukas			Habitats used
						Vengurla	Malvan	Devgad	
149	Red Collared Dove	<i>Streptopelia tranquebarica</i>	P, K	R/LM	U	+	+	+	WD, GS
150	Emerald Dove	<i>Chalcophaps indica</i>	P	R	C	+	+	+	WD
151	Oriental Turtle Dove	<i>Streptopelia orientalis</i>	P, L	R	U	+	+	+	WD, GS
152	Eurasian Collared Dove	<i>Streptopelia decaocto</i>	P	R	C	+	+	+	WD, GS
153	Grey-fronted Green Pigeon	<i>Treron affinis</i>	P	R/LM	U	+	+	-	WD
154	Yellow-footed Green Pigeon	<i>Treron phoenicopterus</i>	P, K	R/LM	C	+	+	+	WD
155	Orange-breasted Green Pigeon	<i>Treron bicinctus</i>	P	PM	U	+	+	-	WD
	Psittaciformes/ Psittaculidae								
156	Vernal Hanging Parrot	<i>Loriculus vernalis</i>	P, K	R	C	+	+	+	WD
157	Rose-ringed Parakeet	<i>Psittacula krameri</i>	P, K	R	C	+	+	+	WD, PL
158	Plum-headed Parakeet	<i>Psittacula cyanocephala</i>	P, K	R/LM	C	+	+	+	WD, PL
	Cuculiformes/ Cuculidae								
159	Grey-bellied Cuckoo	<i>Cacomantis passerinus**</i>	V	Unknown	Unknown	+	+	-	WD, GS
160	Jacobin Cuckoo	<i>Clamator jacobinus</i>	P	W	U	+	+	+	WD
161	Common Hawk Cuckoo	<i>Hierococcyx varius</i>	P, K	R/LM	C	+	+	+	WD
162	Banded Bay Cuckoo	<i>Cacomantis sonneratii</i>	P, V	R/LM	C	+	+	-	WD
163	Eurasian Cuckoo	<i>Cuculus canorus</i>	P	PM	U	-	+	+	WD
164	Lesser Cuckoo	<i>Cuculus poliocephalus</i>	P	PM	U	-	+	-	WD, GS
165	Asian Koel	<i>Eudynamis scolopaceus</i>	P, V, K	R	C	+	+	+	WD, MG, GS
166	Southern Coucal	<i>Centropus sinensis parroti</i>	P, K	R	C	+	+	+	WD, MG, GS
167	Blue-faced Malkoha	<i>Rhopodytes viridirostris</i>	P, V	R	U	+	+	+	WD, MG
168	Sirkeer Malkoha	<i>Taccocua leschenaultii**</i>	V	Unknown	Unknown	-	+	-	WD
	Caprimulgiformes/ Hemiprocnidae								
169	Crested Treeswift	<i>Hemiprocnis coronata</i>	P, V	R	C	-	-	+	GS
	Caprimulgiformes/ Apodidae								
170	Asian Palm Swift	<i>Cypsiurus balasiensis</i>	P, V, A	R	C	+	+	+	WD, FW
171	Indian Swiftlet	<i>Collocalia unicolor</i>	P, V, A, L, MB, PKT	R	U	+	-	-	VGR
172	Little Swift	<i>Apus affinis</i>	P, L	R	C	+	+	+	WD, FW, VGR
	Coraciiformes/ Coraciidae								
173	Indian Roller	<i>Coracias benghalensis</i>	P, V, K	R/LM	C	+	+	+	GS, WD, AG, FW
174	Eurasian Roller	<i>Coracias garrulus</i>	P	W	U	+	+	+	GS, WD
	Coraciiformes/ Alcedinidae								
175	Common Kingfisher	<i>Alcedo atthis</i>	P	R	C	+	+	+	FW, INMDF, MG, AQ, SAL
176	Stork-billed Kingfisher	<i>Pelargopsis capensis</i>	P, V, K	R/LM	U	+	+	+	FW, MG
177	White-throated Kingfisher	<i>Halcyon smyrnensis</i>	P, V, K	R	C	+	+	+	MG, FW, INMDF, SBH, AQ, SAL, GS
178	Black-capped Kingfisher	<i>Halcyon pileata</i>	P, V	W	U	+	+	+	MG, INMDF
179	Oriental Dwarf Kingfisher	<i>Ceyx erithaca</i>	P	MM	U	-	+	-	MG
180	Pied Kingfisher	<i>Ceryle rudis</i>	P, K	R/LM	U	+	+	+	FW, MG, AQ, SAL

	Common name	Scientific name	Observers	Status	Occurrence	Talukas			Habitats used
						Vengurla	Malvan	Devgad	
	Coraciiformes/ Meropidae								
181	Green Bee-eater	<i>Merops orientalis</i>	P, K	R	C	+	+	+	FW, WD, GS, AQ, SAL
182	Chestnut-headed Bee-eater	<i>Merops leschenaultia</i>	P	W	C	+	+	+	FW, WD, GS
183	Blue-tailed Bee-eater	<i>Merops philippinus</i>	P, V	W	U	-	+	-	GS, WD
184	Blue-bearded Bee-eater	<i>Nyctyornis athertoni</i> **	K	Unknown	Unknown	-	+	-	WD
	Bucerotiformes/ Upupidae								
185	Common Hoopoe	<i>Upupa epops</i>	P, V, L, K	R	C	+	+	+	WD, GS
	Bucerotiformes/ Bucerotidae								
186	Malabar Grey Hornbill	<i>Ocyrceros griseus</i>	P	R	U	-	+	-	WD
187	Malabar Pied Hornbill	<i>Anthracoceros coronatus</i>	P, V, K	R	C	+	+	+	WD, PL, GS, MG
188	Indian Grey Hornbill	<i>Ocyrceros birostris</i>	P, K	R/LM	U	+	+	+	WD
	Piciformes/ Megalaimidae								
189	Brown-headed Barbet	<i>Megalaima zeylanica</i>	P, K	R	C	+	+	+	WD
190	Coppersmith Barbet	<i>Megalaima haemacephala</i>	P, K	R	C	+	+	+	WD
191	White-cheeked Barbet	<i>Megalaima viridis</i>	P	R	U	+	+	-	WD
	Piciformes/ Picidae								
192	Rufous Woodpecker	<i>Micropternus brachyurus</i>	P	R	U	-	-	+	WD, PL
193	Lesser Goldenback	<i>Dinopium benghalense</i>	P, V, K	R	C	+	+	+	WD, PL
194	Greater Goldenback	<i>Chrysocolaptes lucidus</i>	P	R	U	+	-	-	WD, PL
195	Yellow-crowned Woodpecker	<i>Dendrocopos mahrattensis</i>	P, V, K	R	U	-	+	-	WD
196	White-naped Woodpecker	<i>Chrysocolaptes festivus</i> **	V	Unknown	Unknown	-	-	+	WD
	Passeriformes/ Pittidae								
197	Indian Pitta	<i>Pitta brachyura</i>	P, V	W	U	-	+	+	WD
	Passeriformes/ Artamidae								
198	Ashy Woodswallow	<i>Artamus fuscus</i>	P	R	C	+	+	+	WD
	Passeriformes/ Vangidae								
199	Common Woodshrike	<i>Tephrodornis pondicerianus</i>	P, V	R	C	+	+	+	PL, WD
200	Bar-winged Flycatcher-shrike	<i>Hemipus picatus</i>	P	R	U	+	-	-	WD
	Passeriformes/ Aegithinidae								
201	Common Iora	<i>Aegithina tiphia</i>	P, K	R	C	+	+	+	PL, WD
	Passeriformes/ Campephagidae								
202	Black-headed Cuckooshrike	<i>Coracina melanoptera</i>	P, V, L	R/LM	C	+	+	+	WD
203	Small Minivet	<i>Pericrocotus cinnamomeus</i>	P, V, K	R	C	+	+	+	PL, WD
204	Orange Minivet	<i>Pericrocotus flammeus</i>	P, K	R	U	-	+	-	WD
205	Large Cuckooshrike	<i>Coracina macei</i>	P	R	U	-	+	-	WD
	Passeriformes/ Laniidae								
206	Brown Shrike	<i>Lanius cristatus</i>	P	W	U	+	-	-	WD, GS
207	Long-tailed Shrike	<i>Lanius schach</i>	P, K	R	C	+	+	+	WD, GS
208	Bay-backed Shrike	<i>Lanius vittatus</i>	P, K	R	U	+	+	+	WD, GS

	Common name	Scientific name	Observers	Status	Occurrence	Talukas			Habitats used
						Vengurla	Malvan	Devgad	
	Passeriformes/ Dicruridae								
209	Black Drongo	<i>Dicrurus macrocercus</i>	P, L, K	R	C	+	+	+	FW, WD, GS, MG
210	Ashy Drongo	<i>Dicrurus leucophaeus</i>	P	W	C	+	+	+	WD
211	White-bellied Drongo	<i>Dicrurus caeruleus</i>	P	R/LM	U	+	+	+	WD
212	Greater Racket-tailed Drongo	<i>Dicrurus paradiseus</i>	P, V, K	R	C	+	+	+	WD
213	Bronzed Drongo	<i>Dicrurus aeneus</i>	P	R	U	+	-	-	WD
	Passeriformes/ Oriolidae								
214	Indian Golden Oriole	<i>Oriolus kundoo</i>	P, K	W	C	+	+	+	WD, GS
215	Black-hooded Oriole	<i>Oriolus xanthornus</i>	P, V, K	R	C	+	+	+	WD, GS
	Passeriformes/ Rhipiduridae								
216	White-browed Fantail	<i>Rhipidura aureola</i>	P	R	C	+	+	+	WD, PL, MG
217	White-spotted Fantail	<i>Rhipidura albicollis albogularis</i>	P, V, K	R	U	-	+	+	WD, PL, MG
	Passeriformes/ Monarchidae								
218	Black-naped Monarch	<i>Hypothymis azurea</i>	P	R	U	+	+	-	WD
219	Asian Paradise-flycatcher	<i>Terpsiphone paradisi</i>	P, V, K	R/LM	U	+	+	+	WD
	Passeriformes/ Corvidae								
220	Rufous Treepie	<i>Dendrocitta vagabunda</i>	P, K	R	C	+	+	+	WD, GS
221	House Crow	<i>Corvus splendens</i>	P, L, K	R	C	+	+	+	WD, SBH, RSH, MG
222	Indian Jungle Crow	<i>Corvus culminatus</i>	P, PKT, K	R	C	+	+	+	WD, SBH, RSH, MG
	Passeriformes/ Paridae								
223	Great Tit	<i>Parus major</i>	P	R	U	+	+	+	WD
224	Indian Yellow Tit	<i>Parus aplanotus</i>	P	R	C	+	+	-	WD
	Passeriformes/ Hirundinidae								
225	Dusky Crag Martin	<i>Ptyonoprogne cancolor</i>	P	R	C	-	+	+	WD
226	Eurasian Crag Martin	<i>Ptyonoprogne rupestris</i>	P	W	U	+	+	+	WD
227	Wire-tailed Swallow	<i>Hirundo smithii</i>	P, V, K	R	C	+	+	+	WD, GS, AQ, SAL, FW
228	Red-rumped Swallow	<i>Cecropis daurica</i>	P, K	R	C	+	+	+	WD, GS, AQ, SAL, FW
229	Barn Swallow	<i>Hirundo rustica</i>	P	W	U	+	-	-	FW
230	Streak-throated Swallow	<i>Petrochelidon fluvicola</i>	P, V	R/LM	U	+	-	-	FW
	Passeriformes/ Alaudidae								
231	Rufous-tailed Lark	<i>Ammomanes phoenicura</i>	P	R	U	+	+	+	GS
232	Oriental Skylark	<i>Alauda gulgula</i>	P	R	C	+	+	+	GS
233	Greater Short-toed Lark	<i>Calandrella brachydactyla</i>	P, L	W	U	+	+	-	GS
234	Malabar Lark	<i>Galerida malabarica</i>	P, K	R	C	+	+	+	GS
	Passeriformes/ Pycnonotidae								
235	Red-vented Bulbul	<i>Pycnonotus cafer</i>	P, K	R	C	+	+	+	WD, GS, MG, PL
236	White-browed Bulbul	<i>Pycnonotus luteolus</i>	P, V	R	U	+	+	+	WD, GS, MG
237	Red-whiskered Bulbul	<i>Pycnonotus jocosus</i>	P, K	R	C	+	+	+	WD, GS, MG, PL
238	Grey-headed Bulbul	<i>Pycnonotus priocephalus</i>	P	R	U	+	+	-	WD

	Common name	Scientific name	Observers	Status	Occurrence	Talukas			Habitats used
						Vengurla	Malvan	Devgad	
	Passeriformes/ Cisticolidae								
239	Grey-breasted Prinia	<i>Prinia hodgsonii</i>	P, K	R	C	+	+	+	WD, GS
240	Ashy Prinia	<i>Prinia socialis</i>	P, K	R	C	+	+	+	WD, GS
241	Plain Prinia	<i>Prinia inornata</i>	P, K	R	C	+	+	+	WD, GS
242	Jungle Prinia	<i>Prinia sylvatica</i>	P	R	C	+	+	+	WD, GS
243	Zitting Cisticola	<i>Cisticola juncidis</i>	P, K	R	U	+	+	-	GS, AG
244	Common Tailorbird	<i>Orthotomus sutorius</i>	P, K	R	C	+	+	+	WD, GS, FW, MG
	Passeriformes/ Acrocephalidae								
245	Blyth's Reed Warbler	<i>Acrocephalus dumetorum</i>	P	W	U	+	+	+	FW
246	Booted Warbler	<i>Iduna caligata</i>	P	W	U	-	+	-	WD
247	Clamorous Reed Warbler	<i>Acrocephalus stentoreus</i>	P, V	W	U	+	+	+	WD
	Passeriformes/ Phylloscopidae								
248	Greenish Warbler	<i>Phylloscopus trochiloides</i>	P, V	W	U	+	+	+	MG, WD
	Passeriformes/ Timaliidae								
249	Indian Scimitar Babbler	<i>Pomatorhinus horsfieldii</i>	P, V	R	U	+	+	-	WD
250	Tawny-bellied Babbler	<i>Dumetia hyperythra</i>	P	R	U	-	+	-	WD
	Passeriformes/ Leiothrichidae								
251	Jungle Babbler	<i>Turdoides striata</i>	P, V, K	R	C	+	+	+	WD, GS, PL
252	Large Grey Babbler	<i>Turdoides malcolmi</i>	P	R	U	+	+	+	WD
253	Brown-cheeked Fulvetta	<i>Alcippe poioicephala</i>	P, V	R	U	-	+	-	WD
	Passeriformes/ Pellorneidae								
254	Puff-throated Babbler	<i>Pellorneum ruficeps</i>	P	R	U	+	+	+	WD
	Passeriformes/ Sylviidae								
255	Yellow-eyed Babbler	<i>Chrysomma sinense</i>	P, V	R	U	-	+	+	WD
	Passeriformes/ Zosteropidae								
256	Oriental White-eye	<i>Zosterops palpebrosus</i>	P	R	U	-	-	+	WD
	Passeriformes/ Sturnidae								
257	Brahminy Starling	<i>Sturnia pagodarum</i>	P, V	R/LM	C	+	+	+	WD, GS
258	Chestnut-tailed Starling	<i>Sturnia malabarica</i>	P	W	C	+	+	+	WD, MG, GS, PL
259	Rosy Starling	<i>Pastor roseus</i>	P	W	C	+	+	+	GS
260	Common Myna	<i>Acridotheres tristis</i>	P, K	R	C	+	+	+	WD,GS, MG
261	Jungle Myna	<i>Acridotheres fuscus</i>	P, K	R	C	+	+	+	WD,GS, MG
	Passeriformes/ Turdidae								
262	Orange-headed Thrush	<i>Zoothera citrina</i>	P, V, K	R	C	+	+	+	WD
263	Indian Blackbird	<i>Turdus merula simillimus**</i>	V	Unknown	Unknown	-	+	+	WD
	Passeriformes/ Muscicapidae								
264	Oriental Magpie Robin	<i>Copsychus saularis</i>	P, K	R	C	+	+	+	WD, GS, FW, MG
265	Indian Robin	<i>Saxicoloides fulicatus</i>	P, PKT, K	R	C	+	+	+	WD, GS, FW, MG
266	Blue Throat	<i>Luscinia svecica</i>	P	W	U	-	-	+	WD
267	White-rumped Shama	<i>Copsychus malabarica</i>	P	R	U	+	-	-	WD

	Common name	Scientific name	Observers	Status	Occurrence	Talukas			Habitats used
						Vengurla	Malvan	Devgad	
268	Black Redstart	<i>Phoenicurus ochruros</i>	P	W	U	-	-	+	WD
269	Common Stonechat	<i>Saxicola torquatus</i>	P	W	C	+	+	+	GS
270	Pied Bushchat	<i>Saxicola caprata</i>	P, V, K	R	C	+	+	+	AG, GS, SAL
271	Blue Rock Thrush	<i>Monticola solitarius</i>	P, H, A, L	W	C	+	+	+	RSH
272	Blue-capped Rock Thrush	<i>Monticola cinclorhynchus**</i>	V	Unknown	Unknown	+	-	-	WD
273	Malabar Whistling Thrush	<i>Myophonus horsfieldii</i>	P, V	R	U	-	-	+	WD
274	Asian Brown Flycatcher	<i>Muscicapa dauurica</i>	P, V, L	W	U	+	-	+	WD
275	Brown-breasted Flycatcher	<i>Muscicapa muttui</i>	P	W	R	+	-	-	WD
276	Tickell's Blue Flycatcher	<i>Cyornis tickelliae</i>	P, K	R	C	+	+	+	WD, MG
277	Verditer Flycatcher	<i>Eumyias thalassinus**</i>	V	Unknown	Unknown	-	-	+	WD
	Passeriformes/ Stenostiridae								
278	Grey-headed Canary Flycatcher	<i>Culicicapa ceylonensis</i>	P	W	U	+	-	-	WD
	Passeriformes/ Chloropseidae								
279	Golden-fronted Leafbird	<i>Chloropsis aurifrons</i>	P	R	C	+	+	+	WD
280	Jerdon's Leafbird	<i>Chloropsis jerdoni</i>	P, V, K	R	C	+	+	+	WD
	Passeriformes/ Dicaeidae								
281	Pale-billed Flowerpecker	<i>Dicaeum erythrorhynchos</i>	P, K	R	C	+	+	+	WD
282	Thick-billed Flowerpecker	<i>Dicaeum agile</i>	P, V, K	R	C	+	+	+	WD
283	Nilgiri Flowerpecker	<i>Dicaeum concolor</i>	P, K	R	U	-	+	-	WD
	Passeriformes/ Nectariniidae								
284	Purple-rumped Sunbird	<i>Leptocoma zeylonica</i>	P, V, K	R	C	+	+	+	WD, PL, MG
285	Purple Sunbird	<i>Cinnyris asiaticus</i>	P	R	C	+	+	+	WD, PL, MG
286	Loten's Sunbird	<i>Cinnyris lotenia</i>	P	R	U	+	+	+	WD, PL
287	Vigor's Sunbird	<i>Aethopyga vigorsii</i>	P, K	R	U	-	+	-	WD
288	Crimson-backed Sunbird	<i>Leptocoma minima**</i>	MU	Unknown	Unknown	-	+	-	WD
	Passeriformes/ Passeridae								
289	House Sparrow	<i>Passer domesticus</i>	P, K	R	C	+	+	+	WD
290	Chestnut-shouldered Petronia	<i>Gymnoris xanthocollis</i>	P, K	R	C	+	+	+	WD, GS
	Passeriformes/ Ploceidae								
291	Baya Weaver	<i>Ploceus philippinus</i>	P, K	R	C	+	+	+	FW, AG, GS
	Passeriformes/ Estrildidae								
292	Indian Silverbill	<i>Euodice malabarica</i>	P	R	C	+	+	+	AG, GS
293	Scaly-breasted Munia	<i>Lonchura punctulata</i>	P	R	C	+	+	+	AG, MG, GS
294	Black-headed Munia	<i>Lonchura malacca</i>	P	R	C	+	+	+	AG, MG, GS
295	White-rumped Munia	<i>Lonchura striata</i>	P, V, K	R	C	+	+	+	AG, MG, GS
	Passeriformes/ Motacillidae								
296	Forest Wagtail	<i>Dendronanthus indicus**</i>	V	Unknown	Unknown	-	+	-	WD, GS
297	White Wagtail	<i>Motacilla alba</i>	P, V	W	C	+	+	+	FW, AQ, SAL
298	White-browed Wagtail	<i>Motacilla maderaspatensis</i>	P, K	R	C	+	+	+	AG, FW, AQ, SAL
299	Citrine Wagtail	<i>Motacilla citreola</i>	P	W	U	-	+	-	AG
300	Yellow Wagtail	<i>Motacilla flava</i>	P, K	W	U	+	+	+	AG

	Common name	Scientific name	Observers	Status	Occurrence	Talukas			Habitats used
						Vengurla	Malvan	Devgad	
301	Grey Wagtail	<i>Motacilla cinerea</i>	P, L	W	C	+	+	+	AG, FW, AQ, SAL
302	Paddyfield Pipit	<i>Anthus rufulus</i>	P, K	R	C	+	+	+	AG, GS, AQ, SAL
303	Tawny Pipit	<i>Anthus campestris</i>	P	W	U	+	-	-	AG, GS, AQ, SAL
304	Blyth's Pipit	<i>Anthus godlewskii</i>	P	W	U	+	-	+	AQ, SAL
305	Tree Pipit	<i>Anthus trivialis</i>	P, V	W	U	+	+	+	GS
306	Richard's Pipit	<i>Anthus richardi</i>	P	W	U	+	+	+	GS
	Passeriformes/ Emberizidae								
307	Black-headed Bunting	<i>Emberiza melanocephala</i>	P	W	U	-	+	+	GS

Observers: ** Species compiled from published literature, P—Present study, H—Hume 1876, V—Vidal 1880, 1883, A—Abdulali 1940, 1942, 1983, ED—Editors 1958, M—Madsen 1988, G—Gole 1994, VK—Katdare 2001, PKT—Pande et al. 2001, PA—Pande 2002a,b, L—Lainer 2003, KMP—Katdare et al. 2004a, MP—Mahabal & Pande 2006, KD—Kasambe & Deshmukh 2011, KM—Kamble et al. 2011, J—Jamalabad 2013, K—Khot 2016, AV—Avalaskar 2016, MU—Shrikrishna Ramachandra Magdum pers. obs. 2017.

Status: R—Resident, W—Winter migrant, PM—Passage migrant, MM—Monsoon migrant, V—Vagrant.

Occurrence: Common—percentage of sighting >3%, uncommon—percentage of sighting 1–3%, rare—percentage of sighting <1%, Unknown—species compiled from literature.

Habitats: GS—Grasslands, WD—Woodlands, FW—Fresh water habitat, AQ—Aquaculture Pond, SAL—Saltpan, INMDF—Intertidal sandy mudflats, MG—Mangroves, SBH—Sandy beach, RSH—Rocky shore, VGR—Vengurla Rocks, OFSH—Offshore waters, AG—Agriculture lands.

total species pool compiled here is only for the coastal regions of the district and more species might be added if one samples the forest areas of the district. Among the talukas surveyed, from Vengurla Taluka, a maximum richness of birds was recorded, and availability of mosaic of habitats within the coastal areas might be attributed for this pattern. The lower diversity of birds in Devgad Taluka can be associated with the presence of laterite grasslands along the coasts and an absence of a large extent of woody vegetation in the coastal areas.

We also observed a few rare and under-recorded species of western Maharashtra, as mentioned in Prasad (2006), such as Amur Falcon, Common Buzzard, Montagu's Harrier *Circus pygargus*, Wilson's Storm-petrel, Masked Booby, Eurasian Oystercatcher, Great Knot, Crab-plover, Orange-breasted Green Pigeon, and Brown-breasted Flycatcher during the study along the Sindhudurg coast.

In comparison with Vidal's (1880) observation, we did not record a few species such as the Red-headed Vulture, the Indian Vulture, the White-rumped Vulture, Sirkeer Malkoha *Taccocua leschenaultii*, Indian Blackbird *Turdus merula simillimus*, Brown Hawk Owl *Ninox scutulata*, Brown Wood Owl *Strix leptogrammica*, Verditer Flycatcher *Eumyias thalassinus*, Forest Wagtail *Dendronanthus indicus*, Blue-capped Rock Thrush *Monticola cinclorhynchus*, Indian Thick-knee *Burhinus indicus*, Grey-bellied Cuckoo *Cacomantis passerinus*, White-naped Woodpecker *Chrysocolaptes festivus*, Bridled Tern *Onychoprion anaethetus*, and the White-

cheeked Tern *Sterna repressa*, during our sampling. In addition, Greater Flamingo *Phoenicopterus roseus* (Abdulali 1942), Brown Skua *Stercorarius antarcticus* (Editors 1958), Pomarine Skua *Stercorarius pomarinus* (Pande 2002a), Arctic Skua *Stercorarius parasiticus* and Brown Noddy *Anous stolidus* (Lainer 2003), Brown Booby *Sula leucogaster* (Jamalabad 2013), Blue-bearded Bee-eater *Nyctornis athertoni* (Khot 2016), Red-throated Diver *Gavia stellata* (Avalaskar 2016), and Crimson-backed Sunbird *Leptocoma minima* (Shrikrishna Ramachandra Magdum pers. obs. 7.xii.2017) were reported from the Sindhudurg coast but not observed by us during the study. The vulture species had been distributed all over India but due to a recent population decline, their distribution range has shrunk to a few pockets, and this might be the reason for not encountering these species in all historical occurrence localities. Furthermore, as discussed earlier, less sampling in the northern Western Ghats might be the reason for missing a few forest dwelling species. Although we conducted coastal and offshore surveys, we did not carry out any surveys during the monsoon months because Bridled Tern is anticipated to occur in Vengurla rocks during the monsoon (Lainer 2003). In brief, less sampling in the Western Ghats and offshore, and rare nature of some species (e.g., Red-throated Diver) might be the reason for missing these birds.

Grey-headed Bulbul has been stated to occur in the Western Ghats, i.e., from Kanyakumari to Goa (Grimmett et al. 2011), but we observed this bird



Image 3. Rare and threatened birds observed along the Sindhudurg coast: a—Bar-tailed Godwit | b—Crab-plover | c—Painted Stork | d—Ruff | e—Masked Booby | f—Great Knot | g—Amur Falcon | h—Great Thick-knee | i—Woolly-necked Stork | j—Eurasian Oystercatcher.

along the Sindhudurg coast. Prasad (2006) listed the Grey-headed Bulbul in Maharashtra's bird list, but comprehensive information about their distribution and occurrences within Maharashtra is not available. We saw it repeatedly (5 times in two locations: Hadi and Karli villages) in the forested areas along the Malvan and Vengurla coasts, and hence we speculate that the distribution range of this species in Maharashtra might be much more widespread than predicted. A survey of the Grey-headed Bulbul's population in abutting districts may be attempted to define the distribution range of this Near-threatened and endemic species of the Western Ghats. Vidal (1880) also had observed a few forest dwelling species, viz., Indian Scimitar Babbler, Blue-capped Rock Thrush, and Malabar Whistling Thrush in wooded habitats close to the coast.

Out of 283 species, 38% of them were migratory. Sindhudurg coast attracts migratory species especially transcontinental migratory birds like waders. Almost 68% of resident birds occur throughout the year in the district. The high richness of resident birds in Sindhudurg is attributed to the availability of the mosaic of habitats. It has also been observed in other studies that variation in bird populations among sites in different seasons and the same has been attributed to environmentally dependent factors such as the change in local and regional habitat conditions (Ericia et al. 2005).

Unregulated tourism and associated developments, sand mining, stray dogs and conversion of laterite grasslands are the major threats to the coastal avifauna in the district. Mochemad (95 species; 10,000 gulls of six species), Karli (117 species; 5,000 gulls of six species), Mitbav (103 species; 2,000 gulls of six species) estuaries, and grasslands such as Tondavali and Chipi (a breeding ground for lapwings, larks; alternative foraging ground for wintering shorebirds; foraging ground for wintering raptors) in Sindhudurg coast support a greater richness of terrestrial and wetland birds. Considering the high species richness of birds and livelihood dependency of humans on the coastal zones, a few estuaries namely Mochemad, Karli and Mitbav estuaries may be recognized as community reserve or conservation reserve to manage the ecosystem sustainably for long-term conservation of these estuaries and sub-habitats therein. Also, these three sites can be perceived as Important Bird and Biodiversity Areas of BirdLife International as they fulfill the IBA criteria.

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