COMMUNICATION

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

Golusu Babu Rao 1,2, Santhanakrishnan Babu 2, Goldin Quadros 2,3, & Vijaykumar Anoop 4

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 Mochemad, 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 environmental impact assessment works. 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
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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

Figure 1. Bird sampling locations in Sindhudurg coast.
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.
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 prioccephalus*, Malabar Grey Hornbill *Ocyceros 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%
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 saltpans 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 saltpan 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 Tandaldeg 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 observed in the intertidal mudflat of Vengurla Bandar on 26 December 2016 (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.
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Figure 2. Species richness of birds in different orders.

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

(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 salt pans on 12 March 2015.

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

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

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

| Common name                  | Scientific name          | Observers | Status | Occurrence | Habitats used |
|------------------------------|--------------------------|-----------|--------|------------|---------------|
| Western Reef Egret           | Egretta gularis          | P, A, K, L| W      | C          | FW, MG, AQ, SAL, RSH, SBH |
| Grey Heron                   | Ardea cinerea            | P, A, K   | W      | C          | FW, MG, AQ, SAL, INMDF |
| Purple Heron                 | Ardea purpurea           | P, K      | R/LM   | C          | FW, MG, AQ, SAL |
| Indian Pond Heron            | Ardeola grayii           | P, K, L   | R/LM   | C          | FW, MG, AQ, SAL, AG, RSH, INMDF |
| Striated Heron               | Butorides striata        | P, V, K   | R      | C          | FW, MG, RSH, SAL, AQ |
| Black-crowned Night Heron    | Nycticorax nycticorax    | P, V, K   | R      | U          | FW |
| Suliformes/ Anhingidae       |                          |           |        |            |               |
| Darter                       | Anhinga melanogaster     | P         | W      | U          | MG, AQ |
| Suliformes/ Phalacrocoracidae|                          |           |        |            |               |
| Little Cormorant             | Phalacrocorax nigro      | P, K      | R/LM   | C          | FW, MG, AQ, SAL |
| Indian Cormorant             | Phalacrocorax fuscicollis| P         | W      | U          | FW, MG, AQ, SAL |
| Suliformes/ Sulidae          |                          |           |        |            |               |
| Masked Booby                 | Sula dactylatra          | J         | Unknown| Unknown    | OPSH |
| Brown Booby                  | Sula leucogaster**       | J         | Unknown| Unknown    |               |
| Falconiformes/ Falconidae    |                          |           |        |            |               |
| Common Kestrel               | Falco tinnunculus        | P, H, V, L, PKT, K | W | C | + + + | GS, VGR |
| Peregrine Falcon             | Falco peregrinus calidus | P, V, A, L| W | C | + + + | SBH, PL |
| Amur Falcon                  | Falco amurensis          | P         | PM     | R          | - | GS |
| Eurasian Hobby               | Falco subbuteo           | P         | W      | U          | - | GS |
| Accipitriformes/ Pandionidae |                          |           |        |            |               |
| Osprey                       | Pandion haliaetus        | P, V, A, L| W | C | + + + | GS, SBH, MG, INMDF, AQ, SAL, VGR |
| Accipitriformes/ Accipitridae|                          |           |        |            |               |
| Red-headed Vulture           | Sarcogyps calvus**       | V         | Unknown| Unknown    | - + - | WD |
| White-rumped Vulture         | Gyps bengalensis**       | V, KM     | Unknown| Unknown    | + + + | WD |
| Indian Vulture               | Gyps indicus**           | V         | Unknown| Unknown    | + + + | WD |
| Black Kite                   | Milvus migrans           | P, K      | R/LM   | C          | GS, SBH, RSH, MG, INMDF, AQ, SAL, WD |
| Brahminy Kite                | Halastur Indus           | P, L, K   | R      | C          | GS, SBH, RSH, MG, INMDF, AQ, SAL, WD |
| Black-winged Kite            | Elanus caeruleus         | P         | R      | C          | GS, AQ, WD, AG |
| White-bellied Sea Eagle      | Haliaeetus leucogaster   | P, H, A, PKT, PA, KMP, L, KT | R | C | + + + | GS, SBH, RSH, INMDF, AQ, SAL, MG, VGR |
| Crested Serpent Eagle        | Spilornis cheela         | P, V, K   | R      | C          | GS, AQ, MG, WD |
| Eurasian Marsh Harrier       | Circus aeruginosus       | P, V, L   | W      | C          | FW, GS, MG |
| Pallid Harrier               | Circus macrourus         | P         | W      | U          | GS |
| Montagu’s Harrier            | Circus pygargus          | P         | W      | U          | GS |
| Shikra                       | Accipiter badius         | P, V, K   | R      | C          | GS, PL, AG, WD |
| Common name                  | Scientific name                  | Observers | Status | Occurrence | Vengurla | Malvan | Devgad | Talukas                     | Habitats used       |
|------------------------------|----------------------------------|-----------|--------|------------|----------|--------|--------|------------------------------|---------------------|
| 59 Besra                     | Accipiter virgatus              | P         | R      | U          | +        | +      | -      | GS, WD                      |                     |
| 60 Oriental Honey-buzzard    | Pernis ptilorhynchus             | P         | R      | C          | +        | +      | +      | GS, PL, MG, VGR, WD         |                     |
| 61 White-eyed Buzzard        | Butastur teesa                  | P, K      | R      | U          | +        | +      | +      | GS, WD                      |                     |
| 62 Common Buzzard            | Buteo buteo                     | P         | PM     | R          | +        | -      | +      | GS, WD                      |                     |
| 63 Bonelli’s Eagle           | Aquila fasciata                 | P         | R      | U          | -        | +      | +      | GS, WD                      |                     |
| 64 Booted Eagle              | Hieraaetus pennatus             | P         | W      | C          | +        | +      | +      | GS, SBH, MG, PL, WD         |                     |
| 65 Crested Hawk Eagle        | Nisaetus cirrhatus              | P, K      | R      | C          | +        | +      | +      | GS, SBH, MG                 |                     |

**Strigiformes/ Tytonidae**

| Common name                  | Scientific name                  | Observers | Status | Occurrence | Vengurla | Malvan | Devgad | Talukas                     | Habitats used       |
|------------------------------|----------------------------------|-----------|--------|------------|----------|--------|--------|------------------------------|---------------------|
| 66 Barn Owl                  | Tyto alba                        | P         | R      | C          | +        | +      | +      | GS, WD                      |                     |
| 67 Indian Scops Owl          | Otus bakkamoena                 | P, V, K   | R      | U          | +        | +      | -      | GS, WD                      |                     |
| 68 Brown Hawk Owl            | Ninox scutulata**               | V         | Unknown| Unknown    | -        | +      | -      | GS, WD                      |                     |
| 69 Brown Wood Owl            | Strix leptogrammica**           | V         | Unknown| Unknown    | -        | -      | +      | WD                           |                     |
| 70 Jungle Owlet              | Glaucidium radiatum             | P, V, K   | R      | C          | +        | +      | -      | GS, WD                      |                     |
| 71 Spotted Owllet             | Athene brama                    | P, V      | R      | C          | +        | +      | -      | GS, WD                      |                     |
| 72 Brown Fish Owl            | Ketupa zeylonensis              | P         | R      | U          | -        | +      | -      | FW, GS                      |                     |

**Caprimulgiformes/ Caprimulgidae**

| Common name                  | Scientific name                  | Observers | Status | Occurrence | Vengurla | Malvan | Devgad | Talukas                     | Habitats used       |
|------------------------------|----------------------------------|-----------|--------|------------|----------|--------|--------|------------------------------|---------------------|
| 73 Jungle Nightjar           | Caprimulgus indicus             | P, V      | R      | C          | +        | +      | +      | WD, GS                      |                     |
| 74 Indian Nightjar           | Caprimulgus asiaticus           | P, V      | R      | U          | +        | +      | +      | WD, GS                      |                     |
| 75 Savanna Nightjar           | Caprimulgus affinis             | P, V      | R      | U          | +        | -      | -      | WD, GS                      |                     |

**Gruiformes/ Railidae**

| Common name                  | Scientific name                  | Observers | Status | Occurrence | Vengurla | Malvan | Devgad | Talukas                     | Habitats used       |
|------------------------------|----------------------------------|-----------|--------|------------|----------|--------|--------|------------------------------|---------------------|
| 76 Slaty-legged Crane        | Rallina eurizonoides             | P         | W      | U          | -        | +      | -      | FW                           |                     |
| 77 Slaty-breasted Rail       | Gallirallus striatus             | P, V      | R      | U          | +        | +      | -      | MG                           |                     |
| 78 White-breasted Waterhen   | Amouranensis phoenicurus         | P, K      | R      | C          | +        | +      | +      | FW, MG, AQ, AG, AA         |                     |
| 79 Common Moorhen            | Gallinula chloropus             | P         | R/LM   | U          | -        | -      | +      | FW, SAL                      |                     |
| 80 Eurasian Coot             | Fulica atra                     | P         | R/LM   | U          | -        | -      | +      | FW, SAL                      |                     |
| 81 Purple Swamphen           | Porphyria porphyria             | P, V      | R/LM   | C          | +        | +      | -      | FW                           |                     |

**Charadriiformes/ Jacanidae**

| Common name                  | Scientific name                  | Observers | Status | Occurrence | Vengurla | Malvan | Devgad | Talukas                     | Habitats used       |
|------------------------------|----------------------------------|-----------|--------|------------|----------|--------|--------|------------------------------|---------------------|
| 82 Pheasant-tailed Jacana    | Hydrophasianus chirurgus         | P, K      | R/LM   | C          | +        | +      | -      | FW                           |                     |
| 83 Bronze-winged Jacana      | Metopidius indicus               | P         | R/LM   | C          | +        | -      | -      | FW                           |                     |

**Charadriiformes/ Haematopodidae**

| Common name                  | Scientific name                  | Observers | Status | Occurrence | Vengurla | Malvan | Devgad | Talukas                     | Habitats used       |
|------------------------------|----------------------------------|-----------|--------|------------|----------|--------|--------|------------------------------|---------------------|
| 84 Eurasian Oystercatcher    | Haematopus ostralegus             | P         | PM     | R          | -        | +      | +      | SBH                          |                     |
| 85 Black-Winged Stilt        | Himantopus himantopus            | P, V      | R      | C          | +        | +      | +      | AQ, SAL                      |                     |
| 86 Crab-plover               | Dromas ardeola                  | P         | PM     | R          | +        | -      | -      | SBH                          |                     |
| 87 Little Ringed Plover      | Charadrius dubius                | P, V, K   | W      | C          | +        | +      | +      | AQ, SAL, SBH, GS           |                     |
| 88 Kentish Plover            | Charadrius alexandrinus          | P, V      | W      | C          | +        | +      | +      | SBH, INMDF, MG, AQ          |                     |
| No. | Common name                  | Scientific name               | Observers | Status | Occurrence | Talukas          | Habits used            |
|-----|------------------------------|--------------------------------|-----------|--------|------------|-------------------|------------------------|
| 89  | Lesser Sand Plover           | Charadrius mongolus           | P, V      | W      | C          | Vengurla, Malvan, Devgad | SBH, INMDF, MG, AQ, SAL, GS, RSH |
| 90  | Greater Sand Plover          | Charadrius leschenaulti       | P         | W      | C          |                   | SBH, INMDF, MG, AQ, SA, RSH |
| 91  | Pacific Golden Plover        | Pluvialis fulva               | P         | W      | C          |                   | SBH, INMDF, MG, AQ, SAL, GS, AG, RSH |
| 92  | Grey Plover                  | Pluvialis squatarola          | P, V      | W      | U          |                   | SBH, AQ, SAL, INMDF, AG |
| 93  | Yellow-wattled Lapwing       | Vanellius malabaricus        | P, V      | R/LM   | C          |                   | GS, AG                   |
| 94  | Red-wattled Lapwing          | Vanellius indicus             | P, K      | R      | C          |                   | MG, AQ, SAL, GS, AG, FW   |
|     | Charadriiformes/              |                               |           |        |            |                   |                        |
|     | Rostratulidae                |                               |           |        |            |                   |                        |
| 95  | Greater Painted-snipe        | Rostratula benghalensis       | P         | R      | U          |                   | GS, AQ                   |
|     | Charadriiformes/              |                               |           |        |            |                   |                        |
|     | Scolopacidae                 |                               |           |        |            |                   |                        |
| 96  | Ruff                         | Philomachus pugnax            | P         | PM     | R          |                   | GS                      |
| 97  | Common Snipe                 | Gallinago gallinago           | P, K      | W      | C          |                   | GS, AQ, AQ, INMDF, AG, GS |
| 98  | Black-tailed Godwit          | Limosa limosa                 | P         | PM     | R          |                   | SAL                     |
| 99  | Bar-tailed Godwit            | Limosa lapponica              | P         | PM     | R          |                   | AQ, INMDF, SBH, GS, MG  |
| 100 | Whimbrel                      | Numenius phaeopus             | P, V      | W      | C          |                   | SBH, INMDF, MG, AQ, SAL, GS |
| 101 | Eurasian Curlew              | Numenius arquata              | P         | W      | C          |                   | SBH, INMDF, MG, AQ, GS  |
| 102 | Common Redshank              | Tringa totanus                | P, K      | W      | C          |                   | SBH, INMDF, MG, AQ, SAL  |
| 103 | Common Greenshank            | Tringa nebularia              | P         | W      | C          |                   | SBH, INMDF, MG, AQ, SAL  |
| 104 | Marsh Sandpiper               | Tringa stagnatilis            | P         | W      | U          |                   | AQ, SAL                  |
| 105 | Green Sandpiper               | Tringa ochropus               | P         | W      | U          |                   | AQ, SAL, GS, AG          |
| 106 | Wood Sandpiper                | Tringa glareola               | P, K      | W      | C          |                   | AQ, SAL, GS, FW, AG      |
| 107 | Terek Sandpiper               | Xenus cinereus                | P         | W      | C          |                   | SAT, SBH, INMDF, MG      |
| 108 | Common Sandpiper              | Actitis hypoleucus            | P, A, PA, L, K | W | C | + | + | SBH, SAL, SBH, INMDF, MG, RSH, FW, GS, AG |
| 109 | Ruddy Turnstone              | Arenaria interpres            | P, V, A, G, KMP, PA, L | W | C | + | + | SBH, RSH, GS |
| 110 | Little Stint                 | Calidris minuta               | P         | W      | C          |                   | AQ, SAL, SBH, INMDF, RSH, GS |
| 111 | Temminck’s Stint             | Calidris temminckii           | P         | W      | C          |                   | AQ, SAL                  |
| 112 | Sanderling                   | Calidris alba                 | P, V      | W      | U          |                   | SBH, INMDF               |
| 113 | Curlew Sandpiper             | Calidris ferruginea           | P, V      | W      | U          |                   | SBH, INMDF, AQ, SAL, RSH |
| 114 | Great Knot                   | Calidris tenuirostris         | P         | PM     | R          |                   | INMDF, SBH               |
| 115 | Broad-billed Sandpiper        | Limicola falcinellus          | P         | W      | U          |                   | SAT, SBH, INMDF          |
| 116 | Dunlin                       | Calidris alpina               | P         | W      | U          |                   | AQ, SAL, INMDF, SBH      |
| 117 | Small Pratincole             | Glareola lacteal             | P         | R/LM   | U          |                   | ASL, SBH                 |
| Common name | Scientific name | Observers | Status | Occurrence | Vengurla | Malvan | Devgad | Talukas | Habitats used |
|-------------|----------------|-----------|--------|------------|----------|--------|--------|--------|--------------|
| 118 Oriental Pratincole | Glareola maldivarum | P | W | R | - | + | - | GS |
| Charadriiformes/ | Burhinidae | | | | | | | | |
| 119 Great Thick-knee | Esacus recurvirostris | P | R/LM | R | + | - | - | FW, INMDF |
| 120 Indian Thick-knee | Burhinus indicus** | V | Unknown | Unknown | - | + | - | FW, GS |
| Charadriiformes/ | Laridae | | | | | | | | |
| 121 Pallas’s Gull | Ichthyaeus ichthyaeus | P | W | C | + | + | + | SBH, OFSH, INMDF |
| 122 Heuglin’s Gull | Larus heuglini | P, V, L | W | C | + | + | + | SBH, OFSH, RSH, INMDF |
| 123 Steppe Gull | Laurus barbarensis | P | W | U | + | + | + | SBH, OFSH, INMDF |
| 124 Slender-billed Gull | Chroicocephalus genei | P | W | C | + | + | + | SBH, OFSH, INMDF |
| 125 Brown-headed Gull | Chroicocephalus brunnicephalus | P, V, A, L | W | C | + | + | + | SBH, OFSH, INMDF |
| 126 Black-headed Gull | Chroicocephalus ridibundus | P, G, L | W | C | + | + | + | SBH, OFSH, INMDF, RSH |
| 127 Gull-billed Tern | Gelochelidon nilotica | P | W | C | + | + | + | SBH, INMDF |
| 128 Lesser Crested Tern | Thalasseus bengalensis | P, V, A, L, VK, KMP, KD | W | C | + | + | + | SBH, OFSH, VGR |
| 129 Greater Crested Tern | Thalasseus bergii | P, V, A, M, VK, PA, KMP, L | R | C | + | + | + | SBH, INMDF, VGR |
| 130 Caspian Tern | Hydranops caspia | P, A, L | W | U | + | + | + | SBH, INMDF |
| 131 Sandwich Tern | Thalasseus sandvicensis | P, G, L | W | U | + | + | + | SBH, INMDF |
| 132 River Tern | Sterna hirundo | P, PA | R/LM | U | + | - | - | FW |
| 133 Little Tern | Sterna albifrons | P, A, G | R/LM | R | + | + | - | FW, SAL |
| 134 Roseate Tern | Sterna dougallii | P, H, A, VK, PA, KMP, L | R/LM | U | + | - | - | VGR |
| 135 Common Tern | Sterna hirundo | P, PA, L | W | R | - | + | - | OFSH |
| 136 Whiskered Tern | Chlidonias hybrida | P | W | U | + | + | + | AQ, SAL, INMDF, SBH |
| 137 White-cheeked Tern | Sterna repressa** | V, M, PA, L | Unknown | Unknown | + | - | - | OFSH |
| 138 Sooty Tern | Onychoprion fuscatus | P, A, M, PA, L | PM | U | + | - | + | OFSH |
| 139 Bridled Tern | Onychoprion anaethetus** | V, A, M, VK, PA, KMP, L | Unknown | Unknown | + | - | - | VGR, OFSH |
| 140 Brown Noddy | Anous stolidus** | L | Unknown | Unknown | + | - | - | OFSH |
| Charadriiformes/ | Stercorariidae | | | | | | | | |
| 141 Brown Skua | Stercorarius antarcticus** | ED | Unknown | Unknown | - | + | - | OFSH |
| 142 Arctic Skua | Stercorarius parasiticus** | L | Unknown | Unknown | + | - | - | OFSH |
| 143 Pomarine Skua | Stercorarius pomarinus** | PA | Unknown | Unknown | + | - | - | OFSH |
| Procellariiformes/ | Oceanitidae | | | | | | | | |
| 144 Wilson’s Storm-petrel | Oceanites oceanicus | P | PM | R | + | - | - | OFSH |
| Gaviiformes/ | Gaviidae | | | | | | | | |
| 145 Red-throated Diver | Gavia stellata** | AV | Unknown | Unknown | - | - | + | OFSH |
| Columbiformes/ | Columbidae | | | | | | | | |
| 146 Common Pigeon | Columba livia | P, H, V, A, PKT, PA, KMP, L, MP, K | R | C | + | + | + | WD, GS, VGR |
| 147 Laughing Dove | Stigmatopelia senegalensis | P | R | C | + | + | + | WD, GS |
| 148 Spotted Dove | Stigmatopelia chinensis | P, K | R | C | + | + | + | WD, GS |
| #  | Common name                          | Scientific name                        | Observers | Status | Occurrence | Vengurla | Malvan | Devgad | Talukas | Habitats used |
|----|--------------------------------------|----------------------------------------|-----------|--------|------------|----------|--------|--------|---------|---------------|
| 149| Red Collared Dove                     | Streptopelia tranquebarica            | P, K      | R/IM   | U          | +        | +      | +      | WD, GS             |
| 150| Emerald Dove                          | Chalcophaps indica                    | P         | R      | C          | +        | +      | +      | WD                  |
| 151| Oriental Turtle Dove                  | Streptopelia orientalis               | P, L      | R      | U          | +        | +      | +      | WD, GS             |
| 152| Eurasian Collared Dove                | Streptopelia decaocto                | P         | R      | C          | +        | +      | +      | WD, GS             |
| 153| Grey-Fronted Green Pigeon             | Treron affinis                        | P         | R/IM   | U          | +        | +      | -      | WD                  |
| 154| Yellow-footed Green Pigeon            | Treron phoenicopterus                 | P, K      | R/IM   | C          | +        | +      | +      | WD                  |
| 155| Orange-breasted Green Pigeon          | Treron bicinctus                      | P         | PM     | U          | +        | +      | -      | WD                  |
| 156| Vernal Hanging Parrot                 | Loriculus vernalis                    | P, K      | R      | C          | +        | +      | +      | WD                  |
| 157| Rose-ringed Parakeet                  | Psittacula krameri                    | P, K      | R      | C          | +        | +      | +      | WD, PL              |
| 158| Plum-headed Parakeet                  | Psittacula cyanocephala               | P, K      | R/IM   | C          | +        | +      | +      | WD, PL              |
| 159| Grey-bellied Cuckoo                   | Cacomantis passerinus**               | V         | Unknown| Unknown    | +        | +      | -      | WD, GS              |
| 160| Jacobin Cuckoo                        | Clamator jacobinus                    | P         | W      | U          | +        | +      | +      | WD                  |
| 161| Common Hawk Cuckoo                    | Hierococcyx varius                   | P, K      | R/IM   | C          | +        | +      | +      | WD                  |
| 162| Banded Bay Cuckoo                     | Cacomantis sonneratti                 | P, V      | R/IM   | C          | +        | +      | +      | WD                  |
| 163| Eurasian Cuckoo                       | Cuculus canorus                      | P         | PM     | U          | -        | +      | +      | WD                  |
| 164| Lesser Cuckoo                         | Cuculus poliocephalus                | P         | PM     | U          | -        | +      | +      | WD, GS              |
| 165| Asian Koel                            | Eudynamys scolopaceus                | P, V, K   | R      | C          | +        | +      | +      | WD, MG,GS           |
| 166| Southern Coucal                       | Centropus sinensis parroti           | P, K      | R      | C          | +        | +      | +      | WD, MG,GS           |
| 167| Blue-faced Malkoha                    | Rhopodytes viridirostris             | P, V      | R      | U          | +        | +      | +      | WD, MG              |
| 168| Sirkeer Malkoha                       | Taccoa leschenaulti**                | V         | Unknown| Unknown    | -        | +      | +      | WD                  |
| 169| Crested Treeswift                     | Hemiprocne coronate                  | P, V      | R      | C          | -        | -      | +      | GS                  |
| 170| Asian Palm Swift                      | Cypsiurus balasiensis                | P, V, A   | R      | C          | +        | +      | +      | WD, FW              |
| 171| Indian Swiftlet                       | Collocalia unicolor                  | P, V, A, L, MB, PKT | R | U | + | - | - | VGR |
| 172| Little Swift                          | Apus affinis                         | P, L      | R      | C          | +        | +      | +      | WD, FW, VGR         |
| 173| Indian Roller                         | Coracias benghalensis                | P, V, K   | R/IM   | C          | +        | +      | +      | GS, WD, AG, FW      |
| 174| Eurasian Roller                       | Coracias garrulus                   | P         | W      | U          | +        | +      | +      | GS, WD              |
| 175| Common Kingfisher                     | Alcedo atthis                        | P         | R      | C          | +        | +      | +      | FW, INMDS, MG, AQ, SAL |
| 176| Stork-billed Kingfisher               | Pelargopsis capensis                 | P, V, K   | R/IM   | U          | +        | +      | +      | FW, MG              |
| 177| White-throated Kingfisher             | Halcyon smyrnensis                   | P, V, K   | R      | C          | +        | +      | +      | MG, FW, INMDS, SBH, AQ, SAL |
| 178| Black-capped Kingfisher               | Halcyon pileata                     | P, V      | W      | U          | +        | +      | +      | MG, INMDS           |
| 179| Oriental Dwarf Kingfisher             | Ceyx erithaca                       | P         | MM     | U          | -        | +      | -      | MG                 |
| 180| Pied Kingfisher                       | Ceryle rudis                         | P, K      | R/IM   | U          | +        | +      | +      | FW, MG, AQ, SAL     |
| Common name (Latin) | Scientific name | Observers | Status | Occurrence | Talukas | Vengurla | Malvan | Devgad | Habitats used |
|--------------------|-----------------|-----------|--------|------------|---------|---------|--------|--------|----------------|
| Coraciiformes/ Meropidae | | | | | | | | | |
| 181 Green Bee-eater | Merops orientalis | P, K | R | + | + | + | FW, WD, GS, AQ, SAL |
| 182 Chestnut-headed Bee-eater | Merops leschenaultia | P | W | C | + | + | + | FW, WD, GS |
| 183 Blue-tailed Bee-eater | Merops philippinus | P, V | W | U | - | - | + | + | GS, WD |
| 184 Blue-bearded Bee-eater | Nyctyornis athertoni** | K | Unknown | Unknown | - | - | + | + | WD |
| Bucerotiformes/ Upupidae | | | | | | | | | |
| 185 Common Hoopoe | Upupa epops | P, V, L, K | R | C | + | + | + | WD, GS |
| Bucerotiformes/ Bucerotidae | | | | | | | | | |
| 186 Malabar Grey Hornbill | Ocyceros griseus | P | R | U | - | - | + | WD |
| 187 Malabar Pied Hornbill | Anthracoceros coronatus | P, V, K | R | C | + | + | + | WD, PL, GS, MG |
| 188 Indian Grey Hornbill | Ocyceros birostris | P, K | R/LM | U | + | + | + | WD |
| Piciformes/ Megalaimidae | | | | | | | | | |
| 189 Brown-headed Barbet | Megalaima zeylanica | P, K | R | C | + | + | + | WD |
| 190 Coppersmith Barbet | Megalaima haemacephala | P, K | R | C | + | + | + | WD |
| 191 White-cheeked Barbet | Megalaima viridis | P | R | U | - | - | + | + | WD |
| Piciformes/ Picidae | | | | | | | | | |
| 192 Rufous Woodpecker | Micropternus brachyurus | P | R | U | - | - | + | WD, PL |
| 193 Lesser Goldenback | Dinopium benghalense | P, V, K | R | C | + | + | + | WD, PL |
| 194 Greater Goldenback | Chrysocolaptes lucidus | P | R | U | + | - | - | WD, PL |
| 195 Yellow-crowned Woodpecker | Dendrocopos mahartensis | P, V, K | R | U | - | - | + | WD |
| 196 White-naped Woodpecker | Chrysocolaptes festivus** | V | Unknown | Unknown | - | - | + | WD |
| Passeriformes/ Pittidae | | | | | | | | | |
| 197 Indian Pitta | Pitta brachyura | P, V | W | U | - | + | + | WD |
| Passeriformes/ Artamidae | | | | | | | | | |
| 198 Ashy Woodswallow | Artamus fuscus | P | R | C | + | + | + | WD |
| Passeriformes/ Vangidae | | | | | | | | | |
| 199 Common Woodshrike | Tephrodornis pandicerianus | P, V | R | C | + | + | + | PL, WD |
| 200 Bar-winged Flycatcher-shrike | Hemipus pictatus | P | R | U | + | - | - | WD |
| Passeriformes/ Aegithinidae | | | | | | | | | |
| 201 Common Iora | Aegithina tichia | P, K | R | C | + | + | + | PL, WD |
| Passeriformes/ Campephagidae | | | | | | | | | |
| 202 Black-headed Cuckoo-shrike | Coracina melanoptera | P, V, L | R/LM | C | + | + | + | WD |
| 203 Small Minivet | Pericrocotus cinnamomeus | P, V, K | R | C | + | + | + | PL, WD |
| 204 Orange Minivet | Pericrocotus flammeus | P, K | R | U | - | - | + | - | WD |
| 205 Large Cuckoo-shrike | Coracina macel | P | R | U | - | - | + | WD |
| Passeriformes/ Lanidae | | | | | | | | | |
| 206 Brown Shrike | Lanius cristatus | P | W | U | + | - | - | WD, GS |
| 207 Long-tailed Shrike | Lanius schach | P, K | R | C | + | + | + | WD, GS |
| 208 Bay-backed Shrike | Lanius vittatus | P, K | R | U | + | + | + | WD, GS |
| Common name                  | Scientific name                        | Observers | Status | Occurrence | Talukas | Habits used |          |
|-----------------------------|----------------------------------------|-----------|--------|------------|---------|-------------|---------|
| Passeriformes/ Dicruridae   |                                        |           |        |            |         |             |         |
| 209 Black Drongo            | Dicrurus macrocercus                   | P, L, K   | R      | C          | V, M, H | WD, GD, MG  |         |
| 210 Ashy Drongo             | Dicrurus leucophaeus                   | P         | W      | C          |          | WD          |         |
| 211 White-bellied Drongo    | Dicrurus caerulescens                  | P         | R      |             | U       | +           | WD      |
| 212 Greater Racket-tailed Drongo | Dicrurus paradiseus               | P, V, K   | R      | C          | +       | +           | WD      |
| 213 Bronzed Drongo          | Dicrurus aeneus                        | P         | R      | U          | +       | -           | WD      |
| Passeriformes/ Oriolidae    |                                        |           |        |            |         |             |         |
| 214 Indian Golden Oriole    | Oriolus kundoo                         | P, K      | W      | C          |          | WD, GD      |         |
| 215 Black-hooded Oriole     | Oriolus xanthornus                     | P, V, K   | R      | C          | +       | +           | WD, GD  |
| Passeriformes/ Rhipiduridae |                                        |           |        |            |         |             |         |
| 216 White-browed Fantail    | Rhipidura aureola                      | P         | R      | C          | +       | +           | WD, PL, MG |
| 217 White-spotted Fantail   | Rhipidura albicollis albogularis       | P, V, K   | R      | U          | -       | +           | WD, PL, MG |
| Passeriformes/ Monarchidae  |                                        |           |        |            |         |             |         |
| 218 Black-naped Monarch     | Hypothymis azurea                      | P         | R      | U          | +       | +           | WD      |
| 219 Asian Paradise-flycatcher| Terpsiphone paradisi                   | P, V, K   | R      |             | LM      | +           | WD      |
| Passeriformes/ Corvidae     |                                        |           |        |            |         |             |         |
| 220 Rufous Treepie          | Dendrocitta vagabunda                  | P, K      | R      | C          | +       | +           | WD, GD  |
| 221 House Crow              | Corvus splendens                       | P, L, K   | R      | C          | +       | +           | WD, SBH, RSH, MG |
| 222 Indian Jungle Crow      | Corvus culminatus                      | P, K      | R      | C          | +       | +           | WD, SBH, RSH, MG |
| Passeriformes/ Paridae      |                                        |           |        |            |         |             |         |
| 223 Great Tit               | Parus major                            | P         | R      | U          | +       | +           | WD      |
| 224 Indian Yellow Tit       | Parus aplanotus                        | P         | R      | C          | +       | -           | WD      |
| Passeriformes/ Hirundinidae |                                        |           |        |            |         |             |         |
| 225 Dusky Crag Martin       | Ptyonoprogne canicolor                 | P         | R      | C          | -       | +           | WD      |
| 226 Eurasian Crag Martin    | Ptyonoprogne rupestris                 | P         | W      | U          | +       | +           | WD      |
| 227 Wire-tailed Swallow     | Hirundo smithii                        | P, V, K   | R      | C          | +       | +           | WD, GS, AQ, SAI, FW |
| 228 Red-rumped Swallow      | Cecropis daurica                       | P, K      | R      | C          | +       | +           | WD, GS, AQ, SAI, FW |
| 229 Barn Swallow            | Hirundo rustica                        | P         | W      | U          | +       | -           | FW      |
| 230 Streak-throated Swallow | Petrochelidon fluviola                  | P, V      | R      | LM         | U       | +           | FW      |
| Passeriformes/ Alaudidae    |                                        |           |        |            |         |             |         |
| 231 Rufous-tailed Lark      | Ammomanes phoenicura                   | P         | R      | U          | +       | +           | GS      |
| 232 Oriental Skylark        | Alauda gulula                          | P         | R      | C          | +       | +           | GS      |
| 233 Greater Short-toed Lark | Calandrella brachyactyla               | P, L      | W      | U          | +       | -           | GS      |
| 234 Malabar Lark            | Galerida malabarica                    | P, K      | R      | C          | +       | +           | GS      |
| Passeriformes/ Pycnonotidae |                                        |           |        |            |         |             |         |
| 235 Red-vented Bulbul       | Pycnonotus cafer                       | P, K      | R      | C          | +       | +           | WD, GS, MG, PL |
| 236 White-browed Bulbul     | Pycnonotus luteolus                    | P, V      | R      | U          | +       | +           | WD, GS, MG |
| 237 Red-whiskered Bulbul    | Pycnonotus jocosus                     | P, K      | R      | C          | +       | +           | WD, GS, MG, PL |
| 238 Grey-headed Bulbul      | Pycnonotus priacephalus                | P         | R      | U          | +       | +           | WD      |
| Common name       | Scientific name               | Observers | Status | Occurrence | Talukas       | Habitats used |
|-------------------|-------------------------------|-----------|--------|------------|---------------|---------------|
|                   |                               |           |        |            | Vengurla | Malvan | Devgad         |               |
| 239 Grey-breasted Prinia | Prinia hodgsonii | P, K | R       | C          | +     | +     | +     | WD, GS        |               |
| 240 Ashy Prinia    | Prinia socialis               | P, K     | R       | C          | +     | +     | +     | WD, GS        |               |
| 241 Plain Prinia   | Prinia inornata               | P, K     | R       | C          | +     | +     | +     | WD, GS        |               |
| 242 Jungle Prinia  | Prinia sylvatica              | P        | R       | C          | +     | +     | +     | WD, GS        |               |
| 243 Zitting Cisticola | Cisticola junciis | P, K | R       | U          | +     | +     | -     | GS, AG        |               |
| 244 Common Tailorbird | Orthotomus sutorius | P, K | R       | C          | +     | +     | +     | WD, GS, FW, MG |               |
| 245 Blyth’s Reed Warbler | Acrocephalus dumetorum   | P         | W       | U          | +     | +     | +     | FW            |               |
| 246 Booted Warbler | Iduna caligata                | P         | W       | U          | -     | +     | -     | WD            |               |
| 247 Clamorous Reed Warbler | Acrocephalus stentoreus | P, V | W       | U          | +     | +     | +     | WD            |               |
| 248 Greenish Warbler | Phylloscopus trochiloides  | P, V     | W       | U          | +     | +     | +     | MG, WD        |               |
| 249 Indian Scimitar Babbling | Pomatorhinus horsfieldi | P, V | R       | U          | +     | +     | -     | WD            |               |
| 250 Tawny-bellied Babbling | Dumetia hyperythra    | P         | R       | U          | -     | +     | -     | WD            |               |
| 251 Jungle Babbling | Turdoides striata             | P, V, K  | R       | C          | +     | +     | +     | WD, GS, PL    |               |
| 252 Large Grey Babbling | Turdoides malcolm            | P         | R       | U          | +     | +     | +     | WD            |               |
| 253 Brown-cheeked Fulvetta | Alcippe pioicephala    | P, V     | R       | U          | -     | +     | -     | WD            |               |
| 254 Puff-throated Babbling | Pellorneum ruficeps   | P         | R       | U          | +     | +     | +     | WD            |               |
| 255 Yellow-eyed Babbling | Chrysomma sinense      | P, V     | R       | U          | -     | +     | +     | WD            |               |
| 256 Oriental White-eye | Zosterops palpebrosus  | P         | R       | U          | -     | -     | +     | WD            |               |
| 257 Brahminy Starling | Sturnia pagodarum         | P, V     | R/LM    | C          | +     | +     | +     | WD, GS        |               |
| 258 Chestnut-tailed Starling | Sturnia malabarica        | P         | W       | C          | +     | +     | +     | WD, MG, GS, PL |               |
| 259 Rosy Starling  | Pastor roseus               | P         | W       | C          | +     | +     | +     | GS            |               |
| 260 Common Myna    | Acridotheres tristis        | P, K     | R       | C          | +     | +     | +     | WD, GS, MG    |               |
| 261 Jungle Myna    | Acridotheres fuscus         | P, K     | R       | C          | +     | +     | +     | WD, GS, MG    |               |
| 262 Orange-headed Thrush | Zoothera citrina  | P, V, K  | R       | C          | +     | +     | +     | WD            |               |
| 263 Indian Blackbird | Turdus merula similimum**  | V        | Unknown | Unknown    | -     | +     | +     | WD            |               |
| 264 Oriental Magpie Robin | Cosycanthus saularis      | P, K     | R       | C          | +     | +     | +     | WD, GS, FW, MG |               |
| 265 Indian Robin   | Saxicoloides fulcatus       | P, PTK, K| R       | C          | +     | +     | +     | WD, GS, FW, MG |               |
| 266 Blue Throat    | Luscinia svecica            | P         | W       | U          | -     | -     | +     | WD            |               |
| 267 White-rumped Shama | Cosycanthus malabarica    | P         | R       | U          | +     | -     | -     | WD            |               |
Bird diversity in the coastal talukas of Sindhudurg District

Rao et al.

| Common name                  | Scientific name                              | Observers | Status | Occurrence | Talukas | Vengurla | Malvan | Devgad | Vengurla Malvan Devgad | Habbits used |
|------------------------------|----------------------------------------------|-----------|--------|------------|---------|----------|--------|--------|----------------------------|-------------|
| Black Redstart               | Phoenicurus ochruros                          | P         | W      | U          | -       | -        | +      | WD                 | WD          |
| Common Stonechat             | Saxicola torquata                            | P         | W      | C          | +       | +        | +      | GS                 |             |
| Pied Bushchat                | Saxicola caprata                             | P, V, K   | R      | C          | +       | +        | +      | AG, GS, SAL          |             |
| Blue Rock Thrush             | Monticola solitarius                          | P, H, A, L| W      | C          | +       | +        | +      | RSH                |             |
| Blue-capped Rock Thrush      | Monticola cinclorhynchus**                   | V         | Unknown| Unknown    | +       | -        | -      | WD                 |             |
| Malabar Whistling Thrush     | Myophonus horsfieldi                         | P, V      | R      | U          | -       | -        | +      | WD                 |             |
| Asian Brown Flycatcher       | Muscicapa daurica                            | P, V, L   | W      | U          | +       | -        | +      | WD                 |             |
| Brown-breasted Flycatcher    | Muscicapa muttui                             | P         | W      | R          | +       | -        | -      | WD                 |             |
| Tickell's Blue Flycatcher    | Cyanis tickelliae                            | P, K      | R      | C          | +       | +        | +      | WD, MG              |             |
| Verditer Flycatcher          | Eumyias thalassinus**                        | V         | Unknown| Unknown    | -       | -        | +      | WD                 |             |
| Grey-headed Canary Flycatcher| Culcicapa ceylonensis                        | P         | W      | U          | +       | -        | -      | WD                 |             |
| Golden-fronted Leafbird      | Chloropsis aurifrons                         | P         | R      | C          | +       | +        | +      | WD                 |             |
| Jerdon's Leafbird            | Chloropsis jerdoni                           | P, V, K   | R      | C          | +       | +        | +      | WD                 |             |
| Pale-billed Flowerpecker     | Dicaeum eurythrannys                         | P, K      | R      | C          | +       | +        | +      | WD                 |             |
| Thick-billed Flowerpecker    | Dicaeum agile                                | P, V, K   | R      | C          | +       | +        | +      | WD                 |             |
| Nilgiri Flowerpecker         | Dicaeum concolor                            | P, K      | R      | U          | -       | +        | -      | WD                 |             |
| Purple-rumped Sunbird        | Leptocoma zeylonica                          | P, V, K   | R      | C          | +       | +        | +      | WD, PL, MG          |             |
| Purple Sunbird               | Cinnyris asiaticus                          | P         | R      | C          | +       | +        | +      | WD, PL, MG          |             |
| Loten's Sunbird              | Cinnyris lotenia                            | P         | R      | U          | +       | +        | +      | WD, PL              |             |
| Vigor's Sunbird              | Aethopyga vigorsci                          | P, K      | R      | U          | -       | +        | -      | WD                 |             |
| Crimson-backed Sunbird       | Leptocoma minima**                           | MU        | Unknown| Unknown    | -       | +        | -      | WD                 |             |
| House Sparrow                | Passer domesticicus                         | P, K      | R      | C          | +       | +        | +      | WD                 |             |
| Chestnut-shouldered Petronia | Gymnoris xanthocollis                       | P, K      | R      | C          | +       | +        | +      | WD, GS              |             |
| Raya Weaver                  | Placeus philipinus                          | P, K      | R      | C          | +       | +        | +      | FW, AG, GS          |             |
| Indian Silverbill            | Euodice malabarica                          | P         | R      | C          | +       | +        | +      | AG, GS              |             |
| Scaly-breasted Munia         | Lornhura punctulata                          | P         | R      | C          | +       | +        | +      | AG, MG, GS          |             |
| Black-headed Munia           | Lornhura malacca                            | P         | R      | C          | +       | +        | +      | AG, MG, GS          |             |
| White-rumped Munia           | Lornhura striata                            | P, V, K   | R      | C          | +       | +        | +      | AG, MG, GS          |             |
| Forest Wagtail               | Dendronanthus indicus**                      | V         | Unknown| Unknown    | -       | +        | -      | WD, GS              |             |
| White Wagtail                | Motacilla alba                              | P, V      | W      | C          | +       | +        | +      | FW, AQ, SAL         |             |
| White-browed Wagtail         | Motacilla maderaspatensis                    | P, K      | R      | C          | +       | +        | +      | AG, FW, AQ, SAL     |             |
| Citrine Wagtail              | Motacilla citreola                          | P         | W      | U          | -       | +        | -      | AG                 |             |
| Yellow Wagtail               | Motacilla flava                             | P, K      | W      | U          | +       | +        |        | AG                 |             |
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 Taccoa leschenaultii, Indian Blackbird Turdus merula similimimus, Brown Hawk Owl Nyctala 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 Sterna hirundo, 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 Noody Anous stolidus (Lainer 2003), Brown Booby Sula leucogaster (Jamalabad 2013), Blue-bearded Bee-eater Nyctyornis athertoni (Khot 2016), Red-throated Diver Gavia stellata (Avalaskar 2016), and Crimson-backed Sunbird Leptocoma minima (Shirkrishna 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 bird 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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