



## Bird diversity of Mundali area (Mahanadi river) under Cuttack Forest Division, Odisha, India

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### ABSTRACT

The bird diversity study of Mundali area in Cuttack Forest Division of Cuttack District, Odisha was carried out from June 2016 to January 2017. During the study, a total of 185 species of birds belonging to 58 families and 20 orders were recorded. Out of 185 species a total 48% (n=88) species resident birds, 46% (n=85) species winter visitors, 4% (n=8) species passage visitors and 2% (n=4) species summer visitors were recorded in the study area. According to frequency of sighting of birds 96 species (53%) were common, 43 species (23%) were uncommon and 28 species (15%) were rare and 18 species (10%) were occasional recorded from the study area.

**Key words:** Avifauna, Cuttack Forest Division, diversity, Mundali area, Odisha

### INTRODUCTION

In Odisha bird life is very rich, with 524 species reported till now (Inskipp, 2014), including historical records, primarily those by Valentine Ball (Ball, 1877, 1878). For Odisha, several studies describe the distribution, behaviour, check list and ecology of birds like Mukherjee (1952), Singh (1993), Acharya and Kar (1996), Acharya et al. (1999), Kar et al. (1999), Sahu and Kar (2000), Sahu and Rout (2005), Gopi et al. (2007a,b), and Pradhan et al. (2014). Many other recent works also report about the richness in avian diversity in protected areas of Odisha (Sahu et al., 2012; Palei et al., 2011, 2012a, b, 2014a, b, c; Palei et al., 2015; Palei et al., 2017; Rajguru, 2017). However, many areas are still unexplored like Mundali area of Mahanadi river. The bird diversity of this protected area is still unknown. The aim of this study is to present a list of the bird species of scientifically explored of this area.

### MATERIAL AND METHODS

The former capital and the second largest city in the eastern Indian state of Odisha is best

known either for its natural heritage, biodiversity and the largest river of Odisha "Mahanadi". The name Cuttack is derived form of "Katak" which figuratively means, 'The Fort', lies between 20° 30' N and 85° 49' E and covers an area of 398 km<sup>2</sup>. The city is located at an elevation of 36 meters above the mean sea level. The physiography of Cuttack elucidates that the city is situated at the apex of the delta formed by Mahanadi and Kathajodi, the two important rivers flowing through the territory. The city has a tropical climate and experiences about 144.39 cm of rainfall during the monsoons. The Mahanadi river delta in Cuttack district starts from Jobra (20° 28' N, 85° 54' E) to Mundali (20° 26' N, 85° 40' E) having semi-urban forest patches and all the Mahanadi and Kathajodi river beds are included in the study area and comprises Cuttack Forest Division.

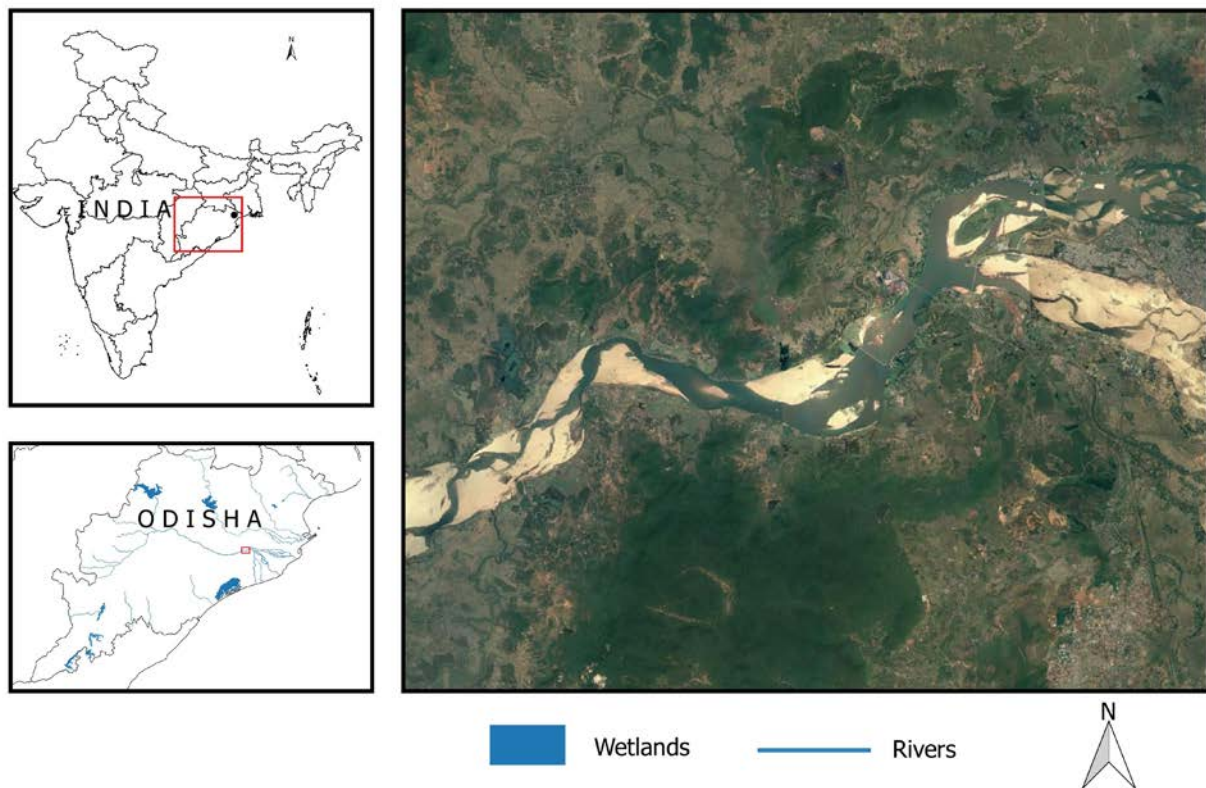
Observations were made, usually for a full day between the months of June 2016 to January 2017. Regular surveys were done by walking on fixed routes throughout the study area. Observations were made in the morning and afternoon, depending on the light condition. Recordings were not made at

the time of heavy rains. Surveys were conducted twice a week. Birds were observed using  $7 \times 50$  and  $7 \times 42$  binoculars and identified. At each site birds were counted using a binocular before moving to the next point as rapidly as possible without disturbing the birds. We observed details on habitat type, season and status (resident/ migrant). In case of doubtful identification, photographs were taken and the species is identified later by consulting experts. The abundance status of birds are categorized into Common (Com) - seen on most of the visits, uncommon (Un Com) - seen on a few visits and Rare (Ra) - Seen once or twice, local movement (LM) and migrants (M). Some birds are resident and their residential status is classified into resident (R) and they are also included.

## RESULTS AND DISCUSSION

During the study, we observed 185 species of birds belonging to 58 families and 20 orders from Mundali area of Cuttack Forest Division. Table 1

depicts detail status, scientific and common names of birds, which shows that the area shows that high diversity of birds. Accipitridae (14), Anatidae (11), Ardeidae (10), Scolopacidae (9), Motacillidae (8), Sylviidae (7), Muscicapidae (7), Charadriidae (7), Sturnidae (6), Alaudidae (5), Cuculidae (5), Estrildidae (5), Laridae (5), Columbidae (5), Strigidae (4), Rallidae (4), Phasianidae (3), Psittacidae (3), Phalacrocoracidae (3), Corvidae (3), Lanidae (3), Campephagidae (3), Pycnonotidae (3), Hirundinidae (3), Cisticolidae (3), Turnicidae (2), Burhinidae (2), Jacanidae (2), Ciconiidae (2), Caprimulgidae (2), Picidae (2), Halcyonidae (2), Megalaimidae (2), Meropidae (2), Nectariniidae (2), Passeridae (2), Oriolidae (2), Monarchidae (2), Dendrocygnidae (1), Podicipedidae (1), Threskiornithidae (1), Anhingidae (1), Falconidae (1), Recurvirostridae (1), Glareolidae (1), Tytonidae (1), Upupidae (1), Coraciidae (1), Apodidae (1), Alcedinidae (1), Cerylidae (1), Aegithinidae (1), Artamidae (1), Dicuridae (1), Pellorneidae (1),

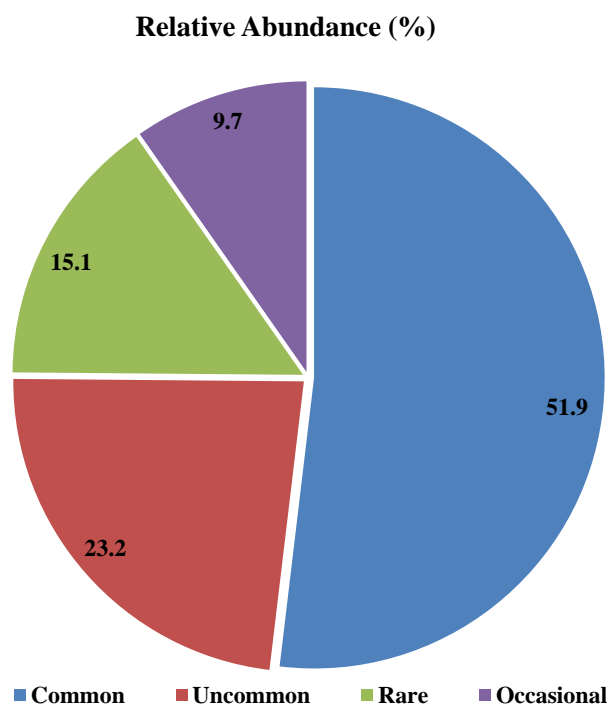


**Fig. 1.** Location map Mundali area of (Mahanadi River) under Cuttack Forest Division, Odisha, India

Leiothrichidae (1), Irenidae (1) and Dicacidae (1) species were recorded during the study area.

According to frequency of sighting of birds, 96 species (52%) were common, 43 species (23%) were uncommon and 28 species (15%) were rare and 18 species (10%) were occasional as recorded from Mundali area during the study period (Fig. 2). During the migratory status out of 185 species a total 48% (n=88) species resident bird, 46% (n=85) species were winter visitor, 4% (n=8) species were passage visitor and 2% (n=4) species summer visitor recorded to the study area. Some migratory birds were recorded in the study area namely Ruddy shelduck *Tadorna ferruginea*, Cotton pigmy goose *Nettapus coromandelianus*, Gadwall *Anas strepera*, Bar headed goose *Anser indicus*, Eurasian Wigeon *Anas Penelope*, Spot bellied

duck *Anas poecilorhyncha*, Northern Shoveler *Anas clypeata*, Northern Pintail *Anas acuta*, Common Teal *Anas crecca*, Red crested pochard *Netta rufina*, Tufted Duck *Aythya fuligula* recorded in the study area. Besides these, birds prey species were recorded during the study area namely Black Winged Kite *Elanus caeruleus*, Black kite *Milvus migrans*, Black eared kite *Milvus ineatus*, White bellied Sea eagle *Haliaeetus leucogaster*, Greater Spotted eagle *Clanga clanga*, Brahminy kite *Haliastur Indus*, Osprey *Pandion haliaetus*, Short toed snake eagle *Circaetus gallicus*, Crested Hawk eagle *Nisaetus cirrhatus*, Crested Serpent eagle *Spilornis cheela*, Booted eagle *Hieraaetus pennatus*, White eyed buzzard *Butastur teesa*, Crested Goshawk *Accipiter trivirgatus* and Shikra *Accipiter badiu* recorded during the Mundali area.



**Fig. 2.** Relative abundance of bird species in percentage in Mundali area of Mahanadi River under Cuttack Forest Division, Odisha, India.

**Table 1.** Checklist of birds recorded in Mahanadi River (Mundali area) under Cuttack Forest Division, with their residential and breeding status

Sl	Family	Common Name	Scientific Name	Abundance	Migratory status	
Order: Galliformes						
1	Phasianidae	Grey francolin	<i>Francolinus pondicerianus</i>	C	R	
2		Red Jungle Fowl	<i>Gallus gallus</i>	UC	R	
3		Indian Peafowl	<i>Pavo cristatus</i>	C	R	
Order: Anseriformes						
4	Dendrocygnidae	Lesser Whistling Duck	<i>Dendrocygna javanica</i>	C	SV	
5		Ruddy shelduck	<i>Tadorna ferruginea</i>	C	WV	
6		Cotton pigmy goose	<i>Nettapus coromandelianus</i>	UC	SV	
7		Gadwall	<i>Anas strepera</i>	C	WV	
8		Bar headed goose	<i>Anser indicus</i>	R	WV	
9		Eurasian Wigeon	<i>Anas penelope</i>	R	WV	
10		Anatidae	Spot bellied duck	<i>Anas poecilorhyncha</i>	C	R
11			Northern Shoveler	<i>Anas clypeata</i>	R	WV
12			Northern Pintail	<i>Anas acuta</i>	C	WV
13			Common Teal	<i>Anas crecca</i>	UC	WV
14			Red crested Pochard	<i>Netta rufina</i>	C	WV
15			Tufted Duck	<i>Aythya fuligula</i>	C	WV
Order: Podicipediformes						
16		Podicipedidae	Little Grebe	<i>Tachybaptus ruficollis</i>	C	R
Order: Ciconiiformes						
17	Ciconiidae	Painted Stork	<i>Mycteria leucocephala</i>	R	WV	
18		Asian Openbill	<i>Anastomus oscitans</i>	C	R	
Order: Pelecaniformes						
19	Threskiornithidae	Black headed Ibis	<i>Threskiornis melanocephalus</i>	UC	WV	
20		Striated Heron	<i>Butorides striata</i>	R	WV	
21		Black crowned Night Heron	<i>Nycticorax nycticorax</i>	UC	R	
22		Cinnamon Bittern	<i>Ixobrychus cinnamomeus</i>	UC	WV	
23		Indian pond Heron	<i>Ardeola grayii</i>	C	R	
24		Ardeidae	Grey Heron	<i>Ardea cinerea</i>	C	WV
25			Purple Heron	<i>Ardea purpurea</i>	C	WV
26			Cattle Egret	<i>Bubulcus ibis</i>	C	R
27			Great Egret	<i>Casmerodius albus</i>	C	R
28	Intermediate Egret		<i>Mesophoyx intermedia</i>	C	R	
29	Little Egret	<i>Egretta garzetta</i>	C	R		

Order: Suliformes					
30	Anhingidae	Darter	<i>Anhinga melanogaster</i>	C	WV
31	Phalacrocoracidae	Little cormorant (Order- Pelecaniformes)	<i>Phalacrocorax niger</i> (Vieillot, 1817)	C	R
32		Indian Shag	<i>Phalacrocorax fuscicollis</i>	UC	WV
33		Great Cormorant	<i>Phalacrocorax carbo</i>	UC	R
Order: Falconiformes					
34	Falconidae	Common Kestrel	<i>Falco tinnunculus</i>	O	WV
Order: Accipitriformes					
35	Accipitridae	Black Winged Kite	<i>Elanus caeruleus</i>	O	WV
36		Black kite	<i>Milvus migrans</i>	C	R
37		Black eared kite	<i>Milvus ineatus</i>	R	R
38		White bellied Sea eagle	<i>Haliaeetus leucogaster</i>	R	PV
39		Greater Spotted eagle	<i>Clanga clanga</i>	R	PV
40		Brahminy kite	<i>Haliastur indus</i>	O	PV
41		Osprey	<i>Pandion haliaetus</i>	UC	PV
42		Short toed snake eagle	<i>Circaetus gallicus</i>	O	PV
43		Crested Hawk eagle	<i>Nisaetus cirrhatus</i>	O	PV
44		Crested Serpent eagle	<i>Spilornis cheela</i>	UC	PV
45		Booted eagle	<i>Hieraaetus pennatus</i>	O	PV
46		White eyed buzzard	<i>Butastur teesa</i>	UC	WV
47		Crested Goshawk	<i>Accipiter trivirgatus</i>	R	WV
48		Shikra	<i>Accipiter badius</i>	C	R
Order: Gruiformes					
49	Rallidae	Common Moorhen	<i>Gallinula chloropus</i>	C	R
50		White-breasted Waterhen	<i>Amaurornis phoenicurus</i>	C	R
51		Grey headed Swamphen	<i>Porphyrio porphyrio</i>	C	WV
52		Common Coot	<i>Fulica atra</i>	UC	WV
Order: Charadriiformes					
53	Turnicidae	Yellow legged Buttonquail	<i>Turnix tanki</i>	UC	R
54		Barred Buttonquail	<i>Turnix suscitator</i>	UC	R
55	Burhinidae	Indian Thick Knee	<i>Burhinus oedicephalus</i>	UC	R
56		Great Thick knee	<i>Esacus recurvirostris</i>	R	R
57	Jacanidae	Pheasant-tailed Jacana	<i>Hydrophasianus chirurgus</i>	UC	WV
58		Bronze-winged Jacana	<i>Metopidius indicus</i>	C	R
59	Recurvirostridae	Black winged Stilt	<i>Himantopus himantopus</i>	C	WV



60		River Lapwing	<i>Vanellus duvaucelli</i>	C	R
61		Grey headed Lapwing	<i>Vanellus cinereus</i>	UC	WV
62		Yellow wattled Lapwing	<i>Vanellus malabaricus</i>	C	R
63	Charadriidae	Red wattled Lapwing	<i>Vanellus indicus</i>	C	R
64		Little ringed Plover	<i>Charadrius dubius</i>	C	R
65		Kentish Plover	<i>Charadrius alexandrines</i>	C	WV
66		Lesser sand Plover	<i>Charadrius mongolus</i>	C	WV
67		Common Snipe	<i>Gallinago gallinago</i>	C	WV
68		Common Redshank	<i>Tringa totanus</i>	UC	WV
69		Common Greenshank	<i>Tringa nebularia</i>	C	WV
70		Green Sandpiper	<i>Tringa ochropus</i>	C	R
71	Scolopacidae	Wood Sandpiper	<i>Tringa glareola</i>	C	R
72		Marsh Sandpiper	<i>Tringa stagnatilis</i>	UC	WV
73		Common Sandpiper	<i>Actitis hypoleucos</i>	C	R
74		Little Stint	<i>Calidris minuta</i>	UC	WV
75		Temminck's Stint	<i>Calidris temminckii</i>	C	WV
76	Glareolidae	Small Pratincole	<i>Glareola lactea</i>	C	WV
77		River Tern	<i>Sterna aurantica</i>	C	R
78		Little Tern	<i>Sternula albifrons</i>	R	WV
79	Laridae	Black bellied Tern	<i>Sterna acuticauda</i>	R	WV
80		Indian Skimmer	<i>Rynchops albicollis</i>	R	WV
81		Whiskered Tern	<i>Chlidonias hybrida</i>	UC	WV
Order: Columbiformes					
82		Eurasian Collared Dove	<i>Streptopelia decaocto</i>	C	WV
83	Columbidae	Spotted Dove	<i>Streptopelia chinensis</i>	C	R
84		Laughing Dove	<i>Streptopelia senegalensis</i>	C	R
85		Common Pigeon	<i>Columba livia</i>	C	R
86		Oriental Turtle Dove	<i>Streptopelia orientalis</i>	O	WV
Order: Psittaciformes					
87	Psittacidae	Alexandrine Parakeet	<i>Psittacula eupatria</i>	C	R
88		Rose-ringed Parakeet	<i>Psittacula krameri</i>	C	R
89		Plum-headed Parakeet	<i>Psittacula cyanocephala</i>	R	WV
Order: Cuculiformes					
90		Jacobin Cuckoo	<i>Clamator jacobinus</i>	O	WV
91		Common Hawk Cuckoo	<i>Hierococcyx varius</i>	C	R
92	Cuculidae	Grey bellied Cuckoo	<i>Cacomantis passerinus</i>	UC	WV
93		Asian Koel	<i>Eudynamys scolopacea</i>	C	R
94		Southern Coucal	<i>Centropus sinensis</i>	C	R

Order: Strigiformes					
95	Tytonidae	Barn Owl	<i>Tyto alba</i>	R	R
96		Indian Scops Owl	<i>Otus bakkamoena</i> (Pennant, 1769)	R	R
97	Strigidae	Spotted Owlet	<i>Athene brama</i>	C	R
98		Indian Eagle Owl	<i>Bubo bubo</i>	R	R
99		Jungle Owlet	<i>Glaucidium radiatum</i>	R	R
Order: Bucerotiformes					
100	Upupidae	Common Hoopoe	<i>Upupa epops</i>	O	WV
Order: Caprimulgiformes					
101	Caprimulgidae	Jungle Nightjar	<i>Caprimulgus indicus</i>	R	R
102		Indian Nightjar	<i>Caprimulgus asiaticus</i>	UC	R
Order: Apodiformes					
103	Apodidae	Asian palm swift	<i>Cypsiurus balasiensis</i>	UC	R
Order: Coraciiformes					
104	Coraciidae	Indian roller	<i>Coracias benghalensis</i>	C	R
105	Halcyonidae	Stork billed kingfisher	<i>Halcyon capensis</i>	R	R
106		White throated kingfisher	<i>Halcyon smyrnensis</i>	C	R
107		Alcedinidae	Common kingfisher	<i>Alcedo atthis</i>	UC
108	Cerylidae	Pied Kingfisher	<i>Ceryle rudis</i>	C	R
109	Meropidae	Blue-tailed Bee-eater	<i>Merops philippinus</i> (Linnaeus, 1766)	C	R
110		Small Bee-eater	<i>Merops orientalis</i> (Latham, 1801)	C	R
Order: Piciformes					
111	Megalaimidae	Brown headed Barbet	<i>Megalaima zeylonica</i>	C	R
112		Coppersmith Barbet	<i>Megalaima haemacephala</i>	C	R
113		Rufous woodpecker	<i>Celeus brachyurus</i>	UC	R
114	Picidae	Black rumped Flameback	<i>Dinopium benghalense</i>	C	R
Order: Passeriformes					
115	Aegithinidae	Common Iora	<i>Aegithina tiphia</i>	C	R
116	Artamidae	Ashy woodshallow	<i>Artamus fuscus</i>	UC	WV
117		Large cuckooshrike	<i>Coracina macei</i>	UC	WV
118	Campephagidae	Black winged cuckooshrike	<i>Coracina melaschistos</i>	R	WV
119		Black headed cuckooshrike	<i>Coracina melanoptera</i>	R	WV

120		Long tailed Shrike	<i>Lanius schach</i>	C	WV
121	Lanidae	Brown Shrike	<i>Lanius cristatus</i>	C	R
122		Bay backed Shrike	<i>Lanius vittatus</i>	R	WV
123	Dicruridae	Black Drongo	<i>Dicrurus macrocerus</i>	C	R
124	Oriolidae	Indian golden Oriole	<i>Oriolus oriolus</i>	C	WV
125		Black hooded Oriole	<i>Oriolus xanthornus</i>	C	R
126		Rufous Treepie	<i>Dendrocitta vagabunda</i>	C	R
127	Corvidae	House Crow	<i>Corvus splendens</i>	C	R
128		Jungle Crow	<i>Corvus macrorhynchos</i>	C	R
129		Streak throated Swallow	<i>Hirundo fluvicola</i>	O	WV
130	Hirundinidae	Barn Swallow	<i>Hirundo rustica</i>	C	R
131		Red rumped Swallow	<i>Hirundo daurica</i>	UC	WV
132		Jerdon's bushlark	<i>Mirafra affinis</i>	C	R
133		Indian bushlark	<i>Mirafra erythroptera</i>	UC	R
134	Alaudidae	Bengal bushlark	<i>Mirafra assamica</i>	O	WV
135		Ashy crowned sparrow Lark	<i>Eremopterix grisea</i>	O	WV
136		Oriental Skylark	<i>Alauda gulgula</i>	C	R
137		Red-vented Bulbul	<i>Pycnonotus cafer</i>	C	R
138	Pycnonotidae	Red-whiskered Bulbul	<i>Pycnonotus jocosus</i>	C	R
139		White browed Bulbul	<i>Pycnonotus luteolus</i>	UC	WV
140		Ashy prinia	<i>Prinia socialis</i>	UC	SV
141	Cisticolidae	Plain Prinia	<i>Prinia inornata</i>	C	R
142		Zitting Cisticola	<i>Cisticola zuncidis</i>	UC	WV
143		Greenish Leaf warbler	<i>Phylloscopus trochiloides</i>	C	WV
144		Yellow eyed Babbler	<i>Chrysomma sinense</i>	C	R
145		Common Tailor Bird	<i>Orthotomus sutorius</i>	C	R
146	Sylviidae	Clamorous Reed Warbler	<i>Acrocephalus stentoreus</i>	UC	WV
147		Blyth's Reed Warbler	<i>Acrocephalus dumetorum</i>	UC	WV
148		Booted Warbler	<i>Iduna caligata</i>	UC	R
149		Common Chiffchaff	<i>Phylloscopus collybita</i>	C	R
150	Pellorneidae	Puff throated Babbler	<i>Pellorneum ruficeps</i>	O	WV
151	Leiothrichidae	Jungle Babbler	<i>Turdoides striatus</i>	C	R
152		Jungle myna	<i>Acridotheres fuscus</i>	C	R
153		Common myna	<i>Acridotheres tristis</i>	C	R
154	Sturnidae	Asian pied starling	<i>Gracupica contra</i>	C	R
155		Chestnut tailed starling	<i>Sturnus malabaricus</i>	C	WV
156		Brahminy starling	<i>Sturnus pagodarum</i>	C	WV
157		Rosy starling	<i>Sturnus roseus</i>	C	WV



158	Monarchidae	Indian paradise flycatcher	<i>Terpsiphone paradisi</i>	O	WV
159		Black naped monarch	<i>Hypothymis azurea</i>	R	WV
160		Orange headed Thrush	<i>Zoothera citrina</i>	O	WV
161		Oriental Magpie Robin	<i>Copsychus saularis</i>	C	R
162		Indian Robin	<i>Saxicoloides fulicata</i>	C	R
163	Muscicapidae	Pied bushchat	<i>Saxicola caprata</i>	C	R
164		Blue rock Thrush	<i>Montocola solitarius</i>	R	WV
165		Asian brown flycatcher	<i>Muscicapa dauurica</i>	UC	WV
166		Taiga flycatcher	<i>Ficedula albicila</i>	UC	WV
167	Irenidae	Jerdon's Leafbird	<i>Chloropsis cochinchinensis</i>	C	R
168	Dicacidae	Pale bellied Flowerpecker	<i>Dicacum erythrohynchos</i>	UC	WV
169		Nectariniidae	Purple rumped sunbird	<i>Nectarinia zeylonica</i>	C
170		Purple sunbird	<i>Nectarinia asiatica</i>	C	WV
171	Passeridae	House sparrow	<i>Passer domesticus</i>	UC	R
172		Baya Weaver	<i>Ploceus philippinus</i>	R	WV
173		Red Munia	<i>Amandava amandava</i>	R	WV
174		White-throated Munia	<i>Lonchura malabarica</i>	O	WV
175	Estrildidae	White-rumped Munia	<i>Lonchura striata</i>	O	WV
176		Scaly breasted Munia	<i>Lonchura punctulata</i>	C	WV
177		Black-headed Munia	<i>Lonchura malacca</i>	UC	WV
178		Yellow wagtail	<i>Motacilla flava</i>	C	WV
179		Citrine wagtail	<i>Motacilla citreola</i>	C	WV
180		Forest Wagtail	<i>Dendronanthus indicus</i>	R	SV
181	Motacillidae	Grey wagtail	<i>Motacilla cinerea</i>	UC	WV
182		White wagtail	<i>Motacilla alba</i>	C	WV
183		White browed wagtail	<i>Motacilla maderaspatensia</i>	UC	WV
184		Paddy field pipit	<i>Anthus rufulus</i>	C	R
185		Olive backed pipit	<i>Anthus hodgsonii</i>	O	WV

M-Migrant, Ra-Rare, Re-Resident, UC-Uncommon, C-Common, WV-Winter visitor, PV-Passage visitor

There are no such major threats in Mundali area. Threats are mainly due to human settlements near the water bodies and River side for which the maximum habitat disturbance occur. People use the water of Mahanandi River in daily basis and put all their garbage in the river, which is the main concern of study area and also intensive fishing for which the habitat gets disturbed. These activities mainly create disturbance for migratory species which entirely depend on river vegetation. Due to lots of

fishing activities these under water vegetations are vanishing causing scarcity of food in the long run.

Grazing of livestock on the dry river land also damage the breeding ground of some migratory species like lapwings, terns, pratincoles, Indian skimmer etc. So, people should be made aware not to use the breeding ground for their purpose during the migration period. Also sand mining from the river for construction purpose is damaging the river habitat and making it too deep, causing flooding of

water and reduction of the feeding habitat. Mega structures in and around Mahanadi and Kathajodi river basin are the major concern, where lots of terrestrial birds previously perch will be vanished

slowly from these places. Though no poaching activities have been recorded in the past, now-a-days fishing nets sometimes become a threat for the migratory birds



a. *Pavo cristatus*



b. *Lonchura striata*



c. *Dendronanthus indicus*



d. *Esacus recurvirostris*



e. *Sterna acuticauda*



f. *Athene brama*

**Fig. 3.** Birds (a-f) of Mahanadi river (Mundali area), Cuttack Forest Division



a. *Anser indicus*b. *Tadorna ferruginea*c. *Haliaeetus leucogaster*d. *Netta rufina***Fig. 4.** Migratory birds (a-d) of Mahanadi river (Mundali area), Cuttack Forest Division**Fig. 5.** Migratory birds habitat of Mahanadi river (Mundali area), Cuttack Forest Division**ACKNOWLEDGEMENT**

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