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An Ornithological Survey Of Parangipettai Town Panchayats, Southeast Coast Of India

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Abstract

The current study presents the avifauna of a multihabitat marine area. Line transect method was applied to examine distribution in the Parangipettai region. We observed 44 terrestrial, estuary, coast, ponds, mangroves, paddy fields, and freshwater bird species. According to the IUCN red list database, 96% are of least concern, and 2% Near Threatened. The study area is needed to maintain the food chain, food web, ecological pyramid, and biodiversity.

Keywords:

Bird; distribution; IUCN; Naturalized; Parangipettai

Introduction

Birds are good indicators of environmental health and climate change. They also provide humans with a range of environmental services. We recorded the distribution of the bird species in the coastal environs in Parangipettai. It is the first report about bird distribution from Parangipettai.

Material And Methods

An ssessment of avian distribution was conducted from December 2018 to November 2019 at Parangipettai coastal environs, Cuddalore, Tamilnadu, India. We surveyed the entire 12 km² of the Parangipettai region. The study estimated the distribution of bird's in different areas from study areas like main roads, streets, agriculture fields, estuary, temporary ponds, permanent ponds, seashore, fish landing centers, mangrove, etc. Line transect and point count methods were employed to assess the bird distribution (Henderson, 2009; Daniel 2017). Bird species were observed after sunrise and before sunset. We documented the birds with DSLR D5300 camera. The bird species were recognized



Figure 1 Map showing the study areas with (roadways, estuary, sea, ponds, etc.)



Figure 1 Distribution of avian taxa in the study

using bird guides (Ali 1993, 1996; Table 1). The list was checked with the IUCN red list category to know the specific status of each species (www.iucnredlist. org). The study areas are demarcated and framed using Google earth pro desktop application and Paint (Fig 1). Charts were built for species, genus distribution (Microsoft Excel, 2007; Fig; 7).





Figure 2. Family wise distribution of birds from the study

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Figure 3. Number of bird's species family wise distribution from the study area



Figure 4. Order wise % bird distribution from the study



Figure 5. Family wise % bird's occupation from the study

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Figure 6. Percentage wise IUCN red list bird's species distribution from the study area

Results

A total of 45 bird species of 40 genera, 30 families and 15 orders were observed in the Porto Novo panchayat, Chidambaram taluk, Cuddalore district, Tamilnadu, India during 2018 to 2019 (Table 1). In the family-wise genus, Ardeidae was high, and Apodidae was low (Table 1). In family-wise species, Motacillidae was highest, and Apodidae the lowest (Fig 4; Table 1). According to the IUCN category, 96% of the species are of least concern, and 2% are Near Threatened and others are not included (Fig 7).

Conclusions

The present study area has various ecosystems like dunes, agriculture fields, temporary ponds, estuary, mangrove, and intertidal zones. The study will be helpful to know the bird's distribution to the researchers, nature lovers, tourists, educationalists, and the government of India. In the future, the study will cover the food source, food chain, and food web distribution for birds from the Parangipettai coastal region.

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Author's Contributions

Original Idea, Design of the study, Survey, Data collection, Laboratory experimental work, data analysis and Manuscript preparation was done by **First author and Corresponding author**.

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Order	Family	Scientific Name	IUCN	Common Name
Accipitriformes	Accipitridae	Accipiter badius J.F.Gmelin	LC	Shikra
Accipitriformes	Accipitridae	Milvus migrans Boddaert	LC	Black kite
Bucerotiformes	Upupidae	Upupa epops Linnaeus	LC	Common Hoopoe
Caprimulgiformes	Apodidae	Cypsiurus balasiensis J.E. Gray	LC	Asian Palm Swift
Charadriiformes	Charadriidae	Vanellus indicus Boddaert	LC	Red Wattled Lapwing
Charadriiformes	Recurvirostridae	Himantopus himantopus Linnaeus	LC	Black Winged Stilt
Charadriiformes	Scolopacidae	Actitis hypoleucos Linnaeus	LC	Common Sandpiper
Charadriiformes	Scolopacidae	Numenius phaeopus Linnaeus	LC	Whimbrel
Ciconiiformes	Ciconiidae	Anastomus oscitans Boddaert	LC	Asian Openbill
Ciconiiformes	Ciconiidae	Mycteria leucocephala Pennant	NT	Painted Stork
Columbiformes	Columbidae	Columba livia J.F. Gmelin	LC	Common Pigeon
Columbiformes	Columbidae	Spilopelia chinensis Scopoli	LC	Spotted Dove
Coraciiformes	Alcedinidae	Ceryle rudis Linnaeus	LC	Pied Kingfisher
Coraciiformes	Alcedinidae	Halcyon smyrnensis Linnaeus	LC	White Throated Kingfisher
Coraciiformes	Meropidae	Merops orientalis Latham	LC	Green Bee Eater

Table 1. Checklist of Ornithology species from the study area

Blue Rock-thrush *Monticola solitarius pandoo* : First record from the southern West Bengal, India

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Keywords:

Bankura; Blue Rock-thrush; Gangajalghati; *Monticola solitarius pandoo*

Introduction:

The Blue Rock-thrush (*Monticola solitarius*) is a small-sized omnivorous bird from Muscicapidae family and is distributed in southern Palearctic, northern Afrotropic, and Oriental regions (Choi et al. 2011). The bird commonly breeds on precipitous cliffs located in rocky areas, sometimes found in cities with many concrete buildings, as well as on crags, and sea cliffs (Choi et al. 2011). It forages on a wide variety of insects including grasshoppers, locusts, crickets, mole-crickets in addition to small reptiles, berries and seeds (Pande et al. 2003; Subramanyam 2017).

This polytypic species is represented by five subspecies occurring all over the world: *M. s. solitarius* (Linnaeus 1758) from northwest Africa, south Europe, north Turkey to Georgia and Azerbaijan, *M. s. longirostris* (Blyth 1847) from Greece and west and south Turkey through the Middle East to the northwest Himalayas to northeast Africa and India, *M. s. pandoo* (Sykes 1832) from central Himalayas to east China and north Vietnam to Greater Sunda Islands, *M. s. philippensis* (Statius Müller 1776) from east Mongolia to Sakhalin south to Japan, extreme north Philippines and northeast China to Indonesia and *M. s. madoci* (Chasen 1940) from Malay Peninsula and north Sumatra (Zuccon and Ericson 2010).

Monticola solitarius pandoo (Sykes 1832) is seen in India and breeds in Kashmir (Ladakh), Uttaranchal (Garhwal) and Himachal Pradesh (Kangra, Kulu) and winters from the foothills of



Figure 1. Geographical location of the study area: Gangajalghati village in Gangajalghati block of Bankura district, West Bengal, India. (Map data: India and West Bengal maps were generated using QGIS; Bankura district from Bandyopadhyay et al. 2020; Gangajalghati block from Das 2017).

the Himalaya throughout India (Ghosh et al. 2008.) The bird has also been reported from other parts of the country including the Bhagirathi Valley of Uttarakhand (Sinha et al. 2019), Arunachal Pradesh (Sharma et al. 2014), Manipur (Choudhury 2009), Tripura (Choudhury 2010), northern districts of West Bengal (Majumdar et al. 1992; Dubey et al. 2015), Kuldiha Wildlife Sanctuary of Odisha (Ghosh et al. 2018), Andhra Pradesh (Subramanyam, 2017), Karnataka (Sharath and Devi Prasad 2019), Maharashtra (Pande et al. 2019) and Gujrat (Chatterjee et al. 2018). A study by Khan 2005 has reported the bird from the Sundarbans East Wildlife Sanctuary of Bangladesh. However, to date, there is no published evidence on occurrence of Blue Rock-thrush in any districts from the southern parts of West Bengal, India.

Observations:

On 1 November 2016 at 13:30 hr the author noticed a Blue Rock-thrush in the Gangajalghati village (23°25'12.0" N 87°07'12.0" E) of Bankura



Figure 2. Blue Rock-Thrush Monticola solitarius pandoo Sykes, 1832, photographed on 1 November, 2016, in the Gangajalghati village of Bankura, West Bengal, India. a. Near a village tubewell | b. Eating an earthworm | c. Foraging on the ground | d. Trying to taste an Annelid. © Ananya Nayak.

district, West Bengal. The study area encompasses a number of ponds, scrub vegetation and human habitation. A few photographs (Figure 1. a, b, c & d) were taken using a Sony DSC-H400 compact camera with 63x Optical Zoom to support further identification. The bird was identified as Blue Rock-thrush (Monticola solitarius pandoo, Sykes 1832) based on physical features with the help of standard field guides (Ali Salim 2002; Grimmett et al. 2011) and web resources (www.birdsofindia. org; Satose et al. 2020). It was a male in firstwinter plumage. The bird was spotted on the top of a two-story building. After half an hour it alighted on the ground and started eating an earthworm (Figure 1.b). After finishing it, the bird consumed a millipede (Figure 1.d). The bird left the place after

2 hours.

Discussion:

Although categorized as a least-concern species by the International Union for Conservation of Nature (IUCN), the Blue Rock-thrush has been reported as vulnerable to human disturbances and to climate and land use change in some parts of the world (Maggini et al. 2014). Despite having a wide range of distribution as winter visitor and resident, very little evidence is available on the migration status of this species throughout the world (Roth 2008; Choi et al. 2011). To date, no comprehensive study has been conducted to elucidate its migratory route in India. *M. s. pandoo* (Sykes 1832) has been reported as a common summer migrant to most of the Himalayas and in winter from peninsular central Pakistan, India (Assam and Meghalaya), Nepal, Sri Lanka, Andaman and Nicobar Islands and east through Bangladesh to northern Burma and most of Thailand, Laos, Vietnam, southern China and Hainan, south to Malaya, Borneo, Brunei and Sumatra (Clement and Hathway 2000). First-year wintering males have been reported from several Asian countries including India, China and Japan (McClure 1954; Choi et al. 2011). The Blue Rockthrush has been shown to exhibit site fidelity in India (Pande et al. 2019). The bird prefers dry rocky areas as their wintering grounds (Grimmett et al. 2011). Gangajalghati village, the study area is surrounded by a number of hilly areas including Koro hill (400 feet, 5 k.m) on the South, Susunia hill (1,470 feet, 18 k.m) on the West and Biharinath (1,480 feet, 30 k.m), the tallest hill of Bankura district on the Northwest. These rocky-hills probably attract this species to Bankura district. Several factors may contribute to the vagrancy in birds including population growth or range expansion, food shortages, unusual weather events or internal errors in their migration apparatus, causing them to depart on deviant headings (Lees and Gilroy 2009).

Conclusion:

The present study reports the first sighting of the Blue Rock-thrush (*Monticola solitarius pandoo*, Sykes 1832) from Bankura and other Southern districts of West Bengal. Further studies are needed to assess the exact cause of winter vagrancy and migratory route of Blue Rock-thrush in South Bengal districts.

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Stakeholder join hands to protect a mixed heronry in an urban area of Sangli district, Maharashtra, India

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Abstract

In city area of Sangli Maharashtra, all related stake holders including. forest department, municipal corporation, local non-governmental organization, local public, media, animal lovers, politically influential people came together, discussed, shared responsibilities and executed all pre-planned activities to save a heronry of little cormorants, pond herons and night herons in a program initiated in 2013 and saved the lives of 1263 birds until the end of 2019. This successful initiative underscores that the involvement of all stakeholders is necessary to conserve any ecosystem.

Key words:

Stake holders, heronry, urban area, conservation.

1. Introduction

Heronry or rookery is a group nesting of colonial water birds of the orders Ciconiformes, Pelecaniformes, and Suliformes, which comprises of herons, egrets, storks, pelicans, ibises, spoonbills, darter and cormorants, showing spatial and temporal clustering of nests (Roshnath et al 2017). Although many studies have showed that human disturbances and urbanization are the main causes of reduction of wild life, extinction of many wild species and change the nesting behavior of birds (James R. Miller et al, 2020; Michael L. Mckinney, 2002; Tanmay Datta et al, 1993; Roshnath et al 2017). However studies have also showed that urbanization is not a lost habitat for birds and they are adapting with this environment and water birds are making their nest in urban and suburban areas. (Roshnath et al 2017). In urbanization there is a need of making people aware

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Fig 1: Nesting site of birds at Shastri Udyan, Sangli



Fig 2: Monitoring of activities by all stake holders

about birds, and their nesting places. The aim of this article is to showcase the involvement of all allied stakeholders for saving the life of water birds nesting in an urban area.

2. Background

SB, received the first report in 2014 through KN, about chicks of Night Heron, Pond heron, Bittern, Cattle Egret and Cormorant were falling from their nests located at a height of 50-60 feet on trees branches at Shastri Udyan, Sangli. Shastri Udyan is located near State Transport (ST) bus stand and approximately 01 km away from Krishna river bank. Earlier, on July 5th, 2013 a big *Acacia* tree had fallen due to stormy winds near the Krishna River and several of nests were destroyed and chicks had fallen down on the ground. In all, 166 chicks were rescued, nurtured and released in nature (Pond heron-102, Little cormorant-64) (per. Com Sharad Apte). Soalso, in 2014, out of 180, chicks only 126 birds (Pond Heron-86 and Little Cormorant-40) could be saved, nurtured and released in their natural habitat. A similar situation had arisen at Shastri Udyan. While visiting the spot, SB and KN observed that 180 chicks had fallen from the trees at Shashtri Udyan. Immediately, forest department was informed, as all these water birds are protected under the Wild Life Protection Act, 1972. Two volunteers Ajit Kashid and Sachin Shingare were appointed to take care of these chicks until fledging. Considering that a large number of birds were falling down every year, involvement of cost for nurturing these chicks, time requirement of every individual who was involved, ownership issues of the nesting site by the Municipal Corporation, etc., there was a need for convening a meeting of all the stakeholders to save these birds and their habitats.

3. Process

3.1. Involvement of stakeholders

Animal lovers from local non-governmental organizations (NGOs), Forest Department of Sangli, Municipal Corporation of Sangli, Management of State Transport of Sangli, Local Media, Animal Lovers, local non-governmental organizations (NGOs) and compassionate local political leaders were identified as stakeholders to save the heronry located at urban area of Sangli. They identified the challenges for mitigation. Challenges included, birds were protected under Wild Life Protection Act, 1972, so Forest Department was the main stakeholder while other challenges were agencies for taking care of chickse falling down from their nests, cost of food for nurturing the chicks until fledging, identification of compassionate and experienced bird handlers, protection of nests at their actual sites, treatment of injuries to chicks directly falling down on the ground and initiation of preventive measures to avoid injuries by providing supportive structures under the tree (above the ground), so that the baby birds falling down from their nests do not directly fall on the ground

Year	Species of Bird	Number of birds	Total number	Place	
2012	Pond Heron	102	166	Harimur Basta	
2015	Little Cormorant	64		Haripur Kasta	
2014	Pond Heron	86	126	Shartai U davan	
2014	Little Cormorant	40	120	Snastri Odyan	
2015	Pond Heron	132	106	Shartai U davan	
2015	Little Cormorant	54	180	Snastri Odyan	
2016	Pond Heron	126	225	Shartai Udayan and ST ayanlah an	
2010	Little Cormorant	99	223	Shashi Odyan and ST workshop	
2017	Pond Heron	166	204	Shartai Udayan and ST ayanlah an	
2017	Little Cormorant	138	304	Shastri Udyan and ST workshop	
	Pond Heron	55			
2018	Little Cormorant	85	172	Shastri Udyan and ST workshop	
	Night Heron	32			
	Pond Heron	29			
2019	Little Cormorant	50	87	Shastri Udyan and ST workshop	
	Night Heron	8			

Table : Number of chicks saved year wise

but fall in nests. All these challenges were discussed in detail and a common agreement of all stakeholders was reached for effective conservation.

3.2. Meeting and Planning

All the stakeholders decided to give a name to this conservation campaign as "SAVE BIRDS". Forest Department of Sangli took responsibility to provide funds for making temporary net under trees by using green shade net and for providing food for nurturing the rescued chicks. Media took responsibility to create awareness amongst the common people about saving the life of these water birds and how they were important for our ecosystem. Animal lovers and local NGOs took responsibility to take care of the chicks falling down of their nests with help of the staff of forest department, Management of State Transport of Sangli assured that they would not disturb the trees in the area where birds made their nests.

3.3. Execution and result

As per the plan Forest Department of Sangli released the funds for purchasing green shade nets and food for feeding the chicks. Forest department also deployed their staffs for looking after of birds with the help of animal lovers and bird handlers. Local persons, staff of municipality, animal lovers and persons from NGOs fixed a green shade net under the nest trees, so that if any birds fell down, they would not get injured or die due to direct impact on ground. Media took initiative and conducted a rally in Sangli city on the occasion of 'World Sparrow Day' to create awareness amongst the local people about saving the birds and to published the good initiative taken by all the stakeholders for saving these water birds and their habitat. NGOs monitored and supported all the activities from time to time. Officers of State Transport gave the permission to fix the green shade net under the tree in their premises and assured undisturbed protection. These joint efforts by all the stakeholders resulted in good outcome thereby saving lives of 1263 birds until year 2019. (Year wise details of saving the birds are mentioned in the table)

4. Discussion

Robbert *et al* 2015 provided a perspective on including various stakeholders and landscape classification to mitigate challenges faced by birds in city area. They have mentioned that cities are multi-stakeholder and multi-land use environments with a complex socioecological system and hence the cities require more than



Fig 3: Area of approx 350 m2 was covered under trees using the green shade net to protect chicks from getting injured by directly falling on ground.

a straight-forward conservation approach. However, their study showed that most publications on urban bird conservation derived from the bird's needs rather than offering a conservation strategy that shows insights in the underlying socio-economic drivers required for the transformation towards bird-friendly cities. Chu Van Cuong et al 2017 in their study identified that lack of stakeholders' understanding of the biosphere reserve approach and their engagement in planning and implementation process was one of the hindrances in effective management process and outcome of biosphere reserve in Kien Giang. It states that understanding of responsibilities of stakeholders is an important aspect in any conservation program. Public awareness process is one of the aspects to save the native species in any conservation program and as per Mckinney, 2002, biodiversity education of the public would be most effective in promoting native animal diversity. Because of its enormous size, wealth, and political influence, a more ecologically informed suburban population could greatly improve the social support for conservation of native species in all ecosystems. Local participation is important in forest conservation; without local participation it is doomed to failure and a notable feature of many case studies is that non-governmental organizations have played important roles as mediators between governments and other stakeholders in forest conservation, like communities and states in which they

operate, non-governmental organizations differ widely in terms of their ideology, political and economic power, and organizational capacity (L. Isager et al) (FAO). The presence of capable and environmentally concerned non-governmental organizations in many countries indicates that changes are taking place in response to growing struggles over natural resources. (L. Isager et al) (FAO). Meriem Bouamrane et al 2016 reported that biosphere reserve must be supported and carried out by its inhabitants and methods and practices can be provided to stakeholder when sincere dialogue happens among them as per their competencies and conservation process should be open. Datta et al, 1993 concluded in their study that, to avoid the danger of human interference, the birds nested in large numbers in the undisturbed zone and also nested higher in disturbed zone. The human interference pressure forces birds to change their preferred nesting tree species and nesting heights and they may choose to nest in urban areas.

5. Conclusion

Joint efforts and involvement of all stake holders resulted is successfully saving the life of chicks, their nesting trees and eventually an ecosystem in an urban area of Sangli district of Maharashtra state in India.

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An updated Avifaunal list of Sunabeda Wildlife Sanctuary, Odisha, India, with notes on the record of Rufous- bellied Eagle (Lophotriorchis kienerii) and Sulphur-bellied warbler (Phylloscopus griseolus)

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Abstract:

The present study was carried out in and around Patora dam of Sunabeda Wildlife sanctuary during March 2016. In a total nine days of field visit, we observed 109 species of birds under 51 families and 17 orders including 24 species newly added to the sanctuary bird list. As a result of the compilation of previously published records and present records, the know number of avifauna of SWLS increase to 192 species under 20 orders and 62 families. The study also highlights the sightings of Rufous- bellied Eagle Lophotriorchis kienerii and Sulphur-bellied warbler Phylloscopus griseolus which were found as significant not only for the sanctuary but also for the state Odisha. The results of this short-term study designate the significance of Patora reservoir in supporting rich bird diversity and also recommend further long-term monitoring on avifauna in the entire sanctuary to get a complete insight into the avifaunal diversity of the Sanctuary.

Key Words:

Checklist; additional records; Bird; Patora dam; Maraguda; Jonk River

Introduction:

Sunabeda Wildlife Sanctuary (SWLS) is one of the 19 protected areas of Odisha, situated at the northwest corner of Nuapada district. Total area of the sanctuary is about 600 sq. km, sharing its boundary with the adjacent state Chhattisgarh. SWLS comes under Decan peninsular biogeographic zone, Eastern plateau province and Chattishgarh-Dandakaranya bio-geographic sub division. Forest types are Southern tropical Dry Deciduous Forest, Northern Tropical Dry Deciduous Forest, Dry Peninsular Forest and Dry Teak Forest (Champion and Seth 1968). Presence of such forest along with hill ranges, rivers, streams and waterfalls makes the sanctuary a pristine habitat for diverse flora and fauna. The sanctuary is also well known for its cultural heritage, as the Maraguda valley embraces the traces of ancient civilization.

Knowledge on the avian diversity of Sunabeda Wildlife Sanctuary is very scanty, only the previously published list of 29 species of Water birds by Lakhar et al. (2011); 108 species birds under 15 orders by Palei et al. (2011) and recent report of 116 species of birds under 51 families by Lakhar et al. (2015) are available. Hence, to facilitate in upgrading the known avifauna of the sanctuary, present study was carried out in and around Patora dam of Sunabeda Wildlife Sanctuary.

Methodology and Study sites:

Patora dam (Latitude 20°40'00" North and Longitude 82°26'30" East) is situated at the northern fringe of Sunabeda Wildlife Sanctuary is characterised by a large water reservoir surrounded by dense forest cover with forest type, Northern Dry Deciduous Forest (Champion and Seth 1968). All together four sites surrounding Patora dam, i.e. Patora Site, Tikirapada Site, Lodhara site and Maraguda site (Figure 1, 2, 3, 4) were selected and a total nine days was surveyed during March 2016. Observations were made mainly in the morning between 6:30 am and 11:30 am by walking along the routes of selected sites. During the field survey birds were observed through direct sighting followed by Photographic records and for identification we used standard field guide books (Grimmett et al. 2011; Arlott 2015; Grewal et al. 2016). Only confirmed species are included in the checklist.

S1-Patora site (Latitude 20°44'14" N & Longitude 82°26'43" E) is located at the northern edge of the dam. The topographic condition of this area is miscellaneous type varied from Agricultural fields to undulating hilly areas ranges from 345m to 480 m.

S2-Tikrapada site (Latitude 20°43'45" N & Longitude 82°27'59" E) situated near to the Lodhra Reserve Forest at the eastern side of the dam. The topography of the site characterised by undulating hilly terrains.

S3-Lodhra site (Latitude 20° 43' 46" N & Longitude 82° 26' 09" E.) is located at the eastern side of the dam adjacent to the Ranimai Reserve Forest of the Sunabeda

Wildlife sanctuary. This area is proposed as Lodhra Protected Forest and mainly surrounded by the river Jonk and Godhus nala. This area is characterised by high hillock with dry deciduous forest face.

S4-Maraguda site (Latitude 20°42'53" N & Longitude 82°27'39"E) is located at the southern side of the dam adjoining to the Manikgarh Reserve Forest inside the core area of the Sanctuary. In this site presence of another pocket size wetland 'Raitalbandh' or 'Maraguda' is the regular habitat of both migratory and resident water birds.

Results:

During this present inventory 109 species belonging 51 families and 17 orders were observed from the four sites in and around Patora dam (Figure 5, 6, 7). Details such as common and scientific names and threatened status of the birds are presented in Table 1. The order Passeriformes showed highest species richness (50 species); followed by Charadriiformes and Pelecaniformes (9 species each); Accipitriformes (7 species); Coraciiformes (6 species); Columbiformes (5 species); Cuculiformes, Piciformes and Gruiformes (4 species each); Anseriformes (3 species), Suliformes (2 species); Phoenicopteriformes, Apodiformes, Psittaciformes, Ciconiiformes, Strigiformes and Bucerotiformes (one species each). With the additions of 24 species and compilation of previously published checklist of Lakhar et al. (2011); Palei et al. (2011) and Lakhar et al. (2015), known number of avifauna of SWLS goes to 192 species under 20 orders and 62 families (see Table 1). Some of the newly recorded birds are Tufted Duck Aythya fuligula, Black Bittern Ixobrychus flavicollis, Indian Black Ibis Pseudibis papillosa, Rufous-bellied Eagle Lophotriorchis kienerii, Wood Sandpiper Tringa glareola, Whiskered Tern Chlidonias hybrid, Little tern Sternula albifrons, Sulphur-bellied Warbler Phylloscopus griseolus, Thick-billed Flowerpecker Dicaeum agile, Pale-billed Flowerpecker Dicaeum erythrorhynchos, White-browed Fantail Rhipidura aureola, etc. From the list of Lakhar et al. (2015), two reported species Streaked Spider-hunter Arachnothera magna and Jerdon's Chloropsis Chloropsis cochinchinensis incorporated in the present compile list of SWLS as Little Spiderhunter Arachnothera longirostra and Jerdon's Leafbird Chloropsis jerdoni. Notes on the record of Rufous-bellied Eagle Lophotriorchis kienerii and Sulphur-bellied Warbler Phylloscopus griseolus are provided below.

Rufous- bellied Eagle (Lophotriorchis kienerii) (Figure 5J) -It is a medium sized resident raptor of South and Southeast Asia. It ranges from Sri Lanka and India, Nepal, Southern China, Bangladesh, Myanmar, Malay Peninsula to Indonesia and Philippines, and to eastern most range Lesser Sundas (Iqbal et al. 2011; BirdLife International, 2018). In India this bird is mainly confined in Himalayan, Northeast and Western Ghats region (Grimmett et al. 2011; Arlott 2015). Records of this raptor from Peninsular India are very sparse, and only a few published records are available. In Peninsula India it was first reported during late nineteenth century by Ball (1878) from Singhbhum District of Jharkhand. Since then, Taher (1992) first sighted the birds from Trimula Hills of Andhra Pradesh. Recently Dutta (2015) recorded two individuals from Kanger Dhara river of Kanger valley National Park, Chhattisgarh and later, Sajan et al. (2016) sighted an adult Rufous-bellied eagle from Palamau Tiger Reserve of Jharkhand. In Odisha, except the record of Nayak and Naik (2014) from Similipal Tiger Reserve, no other decisive records are available concerning the presence of Rufous-bellied Eagle in Odisha. On 24th March 2016, an adult individual was sighted near the Patora dam, at about 10.30 am. The individual was hovering on the sky and after few minutes of observation it gets disappeared. Within this short period of time, we have managed to get some photographic records for further confirmation. With the characteristics of Black hood, white throat and chest, rufous underparts and wing coverts, underparts of tail white and barred black, barred wings with blackish edges, the bird identified as Rufousbellied Eagle, resulting in second confirm record of this raptor in Odisha.

Sulphur-bellied warbler (*Phylloscopus griseolus*) (Figure 7E) -It is a small to medium sized leaf warbler distributed in India, Nepal, Pakistan, Afghanistan, China, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan Mongolia to Russian Federation (BirdLife International 2017). It breeds mainly in Western Pakistan and Wester Himalaya, spends winter in Northern and Central India (Grimmett et al. 2011; Arlott 2015). On 22nd March 2016, at about 9.20 am, a single individual of Sulphur-bellied warbler (*Phylloscopus griseolus*) was observed and photographed. It was foraging on the rocky slopes at the distance of about 40 m from Patora Dam. With the characteristics of bright yellow supercilium extended from the base of bill to above ear coverts, dirtyyellow underparts, buffy-rusty under wings, we identify the bird as Sulphur-bellied warbler. After reviewing hitherto published avifaunal literatures of Odisha, we confirmed our present observation as first photographic record of this warbler in Odisha.

Discussion:

During these 9 days of observation, among the four study sites maximum number of species were found in Site 1 (n = 89), followed by Site 4 (n = 80), Site 2 (n = 52) and Site 3 (n = 42). The reason of high species richness in Site 1 and Site 2 may be the presence of varied habitat types than those of Site 2 and 3. At present, in our study, SWLS has one endangered, one vulnerable, three near threatened and 187 species of birds under least concern category. The present study also emphasized, that only a small portion (Patora Dam) of the Sanctuary was studied for 9 days, a more intensive study and longer period of survey would reveal many additional bird species from this least explored area of Odisha.

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Figure 1: Map showing the selected study sites around Patora Dam, Sunabeda Wildlife Sanctuary, Odisha, India

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SI.No.	Order/Family/ Common Name	Scientific Name	Present Study	Threatened Status	Previous Studies
Anseri	formes: Anatidae				
1	Lesser Whistling-Duck	Dendrocygna javanica	S4	LC	Lahkar et al.2013; Lahkar et al.2015
2	Ruddy Shelduck	Tadorna ferruginea	adorna ferruginea LC		Lahkar et al.2013; Lahkar et al.2015
3	Common Pochard	Aythya ferina	ua VU		Lahkar et al.2013
4	Gadwall	Mareca strepera		LC	Lahkar et al.2013; Lahkar et al.2015
5	Northern Pintail	Anas acuta		LC	Lahkar et al. 2013; Lahkar et al.2015
6	Common Teal	Anas crecca		LC	Lahkar et al. 2013; Lahkar et al.2015
7	Asian Pygmy Goose	Nettapus coromandelianus	S4	LC	Lahkar et al. 2013
8	Tufted Duck	Aythya fuligula	S1	LC	*
Phoenicopteriformes: Podicipedidae					
9	Little Grebe	Tachybaptus ruficollis	S4	LC	Lahkar et al.2013

Table 1: Annotated list of recorded birds from Sunabeda Wildlife Sanctuary, Nuapada, Southern Odisha, India

 (LC- Least Concern, VU- Vulnerable, EN- Endangered, NT- Near Threatened, * - additional records for SWLS)



Gallifo	rmes: Phasianidae				
10	Indian Peafowl	Pavo cristatus		LC	Palei et al. 2011
11	Jungle Bush Quail	Perdicula asiatica		LC	Palei et al. 2011
12	Painted Bush Quail	Perdicula erythrorhyncha		LC	Lahkar et al.2015
Ciconii	iformes: Ciconiidae				
13	Asian Openbill	Anastomus oscitans	S1,S4	LC	Palei et al. 2011; Lahkar et al.2015
Sulifor	mes: Phalacrocoracidae				
14	Indian Cormorant	Phalacrocorax fuscicollis		LC	Palei et al. 2011
15	Great Cormorant	Phalacrocorax carbo	S4	LC	Lahkar et al.2013; Lahkar et al.2015
16	Little Cormorant	Phalacrocorax niger	\$1, \$2, \$3, \$4	LC	Palei et al. 2011; Lahkar et al.2013; Lahkar et al.2015
Pelecar	niformes: Anhingidae				
17	Oriental Darter	Anhinga melanogaster		NT	Lahkar et al.2013
Pelecar	niformes: Ardeidae				
18	Cinnamon Bittern	Ixobrychus cinnamomeus	S1, S4	LC	Lahkar et al.2015
19	Black Bittern	Ixobrychus flavicollis	S4	LC	*
20	Purple Heron	Ardea purpurea	S4	LC	Lahkar et al.2013; Lahkar et al.2015
21	Intermediate Egret	Mesophoyx intermedia	ntermedia S1, S2, S3, S4		Lahkar et al.2013
22	Great Egret	Ardea alba		LC	Lahkar et al.2013; Lahkar et al.2015
23	Little Egret	Egretta garzetta	\$1, \$2, \$3, \$4	LC	Palei et al. 2011; Lahkar et al.2013; Lahkar et al.2015
24	Cattle Egret	Bubulcus ibis	S1, S2, S3, S4	LC	Palei et al. 2011; Lahkar et al.2013; Lahkar et al.2015
25	Indian Pond-Heron	Ardeola grayii	\$1, \$2, \$3, \$4	LC	Palei et al. 2011; Lahkar et al.2013; Lahkar et al.2015
26	Black-crowned Night- Heron	Nycticorax nycticorax	S1	LC	Palei et al. 2011; Lahkar et al.2015
27	Striated Heron	Butorides striata		LC	Palei et al. 2011
Pelecar	niformes: Threskiornithid	lae			
28	Indian Black Ibis	Pseudibis papillosa	S2	LC	*
Accipit	riformes: Pandionidae				
29	Osprey	Pandion haliaetus	S1, S2, S4	LC	Lahkar et al.2013; Lahkar et al.2015
Accipit	triformes: Accipitridae				
30	Black-shouldered Kite	Elanus caeruleus	S1	LC	Palei et al.2011; Lahkar et al.2015

31	Black Kite	Milvus migrans		LC	Palei et al. 2011
32	Crested Serpent-Eagle	Spilornis cheela S1, S2, S3 S4		LC	Palei et al. 2011; Lahkar et al.2015
33	Short-toed Eagle	Circaetus gallicus		LC	Lahkar et al.2015
34	Rufous-bellied Eagle	Lophotriorchis kienerii	S1	NT	*
35	Shikra	Accipiter badius	S1, S2, S3, S4	LC	Palei et al. 2011; Lahkar et al.2015
36	Steppe Eagle	Aquila nipalensis		EN	Palei et al. 2011
37	Oriental honey buzzard	Pernis ptilorhynchus	S1	LC	Palei et al. 2011
Gruifo	rmes: Rallidae				
38	White-breasted Waterhen	Amaurornis phoenicurus	S1	LC	Lahkar et al. 2013; Palei et al. 2011; Lahkar et al.2015
39	Brown Crake	Zapornia akool		LC	Palei et al. 2011
40	Purple Swamphen	Porphyrio porphyrio	S4	LC	Lahkar et al. 2013; Lahkar et al.2015
41	Common Moorhen	Gallinula chloropus	Gallinula chloropus S4		Lahkar et al. 2013; Palei et al. 2011; Lahkar et al.2015
42	Eurasian Coot	<i>Fulica atra</i> S1, S4 LC		Lahkar et al. 2013; Lahkar et al.2015	
Charadriiformes: Charadriidae					
43	Red-wattled Lapwing	Vanellus indicus	S1, S2, S3, S4	LC	Lahkar et al. 2013; Lahkar et al.2015
44	Yellow-wattled Lapwing	Vanellus malabaricus		LC	Palei et al. 2011
45	Little Ringed Plover	Charadrius dubius	S1, S2, S3, S4	LC	Lahkar et al. 2013; Lahkar et al.2015
Charac	driiformes: Jacanidae				
46	Pheasant-tailed Jacana	Hydrophasianus chirurgus	S4	LC	Lahkar et al. 2013; Lahkar et al.2015
47	Bronze-winged Jacana	Metopidius indicus	S4	LC	Lahkar et al. 2013; Lahkar et al.2015
Charao	driiformes: Scolopacidae				
48	Common Sandpiper	Actitis hypoleucos	S1, S2, S3, S4	LC	Palei et al. 2011; Lahkar et al. 2013
49	Wood Sandpiper	Tringa glareola	S1, S2	LC	*
50	Temminck's Stint	Calidris temminckii		LC	Lahkar et al.2015
Charao	driiformes: Turnicidae				
51	Common Buttonquail	Turnix sylvaticus		LC	Palei et al. 2011
Charac	driiformes: Glareolidae				
52	Small Pratincole	Glareola lactea	S2, S4	LC	Lahkar et al. 2013; Lahkar et al.2015
Charac	driiformes: Laridae				
53	Whiskered Tern	Chlidonias hybrid	S2, S4	LC	*

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54	Little tern	Sternula albifrons	S4	LC	*
Colum	biformes: Columbidae				
55	Rock Dove	Columba livia	$\begin{array}{c} Columba \ livia \\ S4 \\ S4 \\ \end{array} \right LC $		Palei et al. 2011
56	Eurasian Collared-Dove	Streptopelia decaocto	S1, S2, S3, S4	LC	Palei et al. 2011; Lahkar et al.2015
57	Spotted-necked Dove	Streptopelia chinensis	S1, S2, S3, S4	LC	Palei et al. 2011; Lahkar et al.2015
58	Emerald Dove	Chalcophaps indica		LC	Palei et al. 2011
59	Laughing Dove	Streptopelia senegalensis	S1, S2	LC	Lahkar et al.2015
60	Yellow-footed Pigeon	Treron phoenicopterus	S1, S4	LC	Palei et al. 2011; Lahkar et al.2015
61	Orange-breasted Green Pigeon	Treron bicinctus		LC	Lahkar et al.2015
62	Oriental Turtle Dove	Streptopelia orientalis		LC	Lahkar et al.2015
Caprin	nulgiformes: Caprimulgic	lae			
63	Indian Nightjar	Caprimulgus asiaticus		LC	Palei et al. 2011
64	Large-tailed Nightjar	Caprimulgus macrurus		LC	Lahkar et al.2015
Cuculi	formes: Cuculidae				
65	Common Koel	Eudynamys scolopaceus	S1, S4	LC	Palei et al. 2011; Lahkar et al.2015
66	Jacobin Cuckoo	Clamator jacobinus		LC	Palei et al. 2011
67	Sirkeer Malkoha	Phaenicophaeus leschenaultia	S1	LC	Lahkar et al.2015
68	Greater Coucal	Centropus sinensis	S1, S4	LC	Palei et al. 2011; Lahkar et al.2015
69	Common Hawk Cuckoo	Hierococcyx varius	S1, S2	LC	Palei et al. 2011; Lahkar et al.2015
70	Indian Cuckoo	Cuculus micropterus		LC	Palei et al. 2011
Strigifo	ormes: Tytonidae				
71	Common Barn Owl	Tyto alba		LC	Palei et al. 2011
Strigifo	ormes: Strigidae				
72	Spotted Owlet	Athene brama	S4	LC	Palei et al. 2011; Lahkar et al.2015
73	Jungle Owlet	Glaucidium radiatum		LC	Palei et al. 2011; Lahkar et al.2015
74	Collared Scops Owl	Otus bakkamoena		LC	Palei et al. 2011
75	Eurasian Eagle Owl	Bubo bubo		LC	Palei et al. 2011
76	Brown Fish Owl	Ketupa zeylonensis		LC	Palei et al. 2011
Trogon	iformes: Trogonidae				
77	Malabar Trogon	Harpactes fasciatus		LC	Palei et al. 2011
Apodif	ormes: Apodidae				
78	House Swift	Apus nipalensis	S1	LC	Palei et al. 2011; Lahkar et al.2015

79	Crested Treeswift	Hemiprocne coronata		LC	Palei et al. 2011
Bucerotiformes: Bucerotidae		*			
80	Indian Gray Hornbill	Ocyceros birostris	S1, S4	LC	Palei et al. 2011; Lahkar et al.2015
Bucero	tiformes: Upupidae				
81	Common Hoopoe	Upupa epops		LC	Palei et al. 2011; Lahkar et al.2015
Coraci	iformes: Alcedinidae				
82	White-throated Kingfisher	Halcyon smyrnensis	S1, S2, S3, S4	LC	Palei et al. 2011
83	Pied Kingfisher	Ceryle rudis	S1	LC	*
84	Common Kingfisher	Alcedo atthis	S1, S3, S4	LC	Palei et al. 2011; Lahkar et al.2015
Coraci	iformes: Meropidae				
85	Green Bee-eater	Merops orientalis	S1, S2, S3, S4	LC	Palei et al. 2011; Lahkar et al.2015
86	Chestnut-headed Bee- eater	Merops leschenaulti		LC	Palei et al. 2011
87	Blue-tailed Bee-eater	Merops philippinus	S1,S2, S4	LC	Palei et al. 2011
Coraci	iformes: Coraciidae				
88	38Indian RollerCoracias bengh		S1, S2, S3, S4	LC	Palei et al. 2011; Lahkar et al.2015
Picifor	mes: Megalaimidae				
89	Coppersmith Barbet	Psilopogon haemacephalus	S1, S4	LC	Palei et al. 2011; Lahkar et al.2015
90	Brown-headed Barbet	Psilopogon zeylanicus	S1, S2, S4	LC	Palei et al. 2011; Lahkar et al.2015
Picifor	mes: Picidae				
91	Brown-capped Woodpecker	Dendrocopos nanus	S1, S4	LC	*
92	Heart-spotted Woodpecker	Hemicircus canente		LC	Palei et al. 2011
93	Rufous Woodpecker	Micropternus brachyurus		LC	Palei et al. 2011
94	White-naped Woodpecker	Chrysocolaptes festivus		LC	Palei et al. 2011
95	Yellow-crowned Woodpecker	Dendrocopos mahrattensis		LC	Palei et al. 2011
96	Black-rumped Flameback	Dinopium benghalense	S1, S4	LC	Palei et al. 2011
97	Greater Flame-backed Woodpecker	Chrysocolaptes lucidus		LC	Lahkar et al.2015
98	Fulvous-breasted Woodpecker	Dendrocopos macei		LC	Lahkar et al.2015
Psittac	iformes: Psittaculidae				
99	Plum-headed Parakeet	Psittacula cyanocephala	S1, S2, S3, S4	LC	Palei et al. 2011; Lahkar et al.2015

100	Rose-ringed Parakeet	Psittacula krameri		LC	Palei et al. 2011; Lahkar et al.2015
101	Alexandrine Parakeet	Psittacula eupatria NT		NT	Lahkar et al.2015
Passeri	iformes: Pittidae				
102	Indian Pitta	Pitta brachyura		LC	Palei et al. 2011
Passeri	iformes: Vangidae				
103	Common Woodshrike	Tephrodornis pondicerianus	S3	LC	*
Passeri	iformes: Aegithinidae				
104	Common Iora	Aegithina tiphia	S1, S2, S3, S4	LC	Lahkar et al.2015
105	Marshall's Iora	Aegithina nigrolutea		LC	Lahkar et al.2015
Passeri	iformes: Campephagidae	1	1	1	
106	Small Minivet	Pericrocotus cinnamomeus	S1, S4	LC	Lahkar et al.2015
107	Scarlet Minivet	Pericrocotus flammeus		LC	Palei et al. 2011
108	White-bellied Minivet	Pericrocotus erythropygius		LC	Lahkar et al.2015
109	Large Cuckooshrike	Coracina macei	S1, S2	LC	Palei et al. 2011; Lahkar et al.2015
110	Black-headed Cuckooshrike	Lalage melanoptera		LC	Lahkar et al.2015
Passeri	iformes: Laniidae				
111	Long-tailed shrike	Lanius schach	S1, S2	LC	Lahkar et al.2015
112	Brown Shrike	Lanius cristatus LC		LC	Lahkar et al.2015
Passeri	iformes: Oriolidae				
113	Black-hooded Oriole	Oriolus xanthornus	S1, S4	LC	Palei et al. 2011; Lahkar et al.2015
114	Indian Golden Oriole	Oriolus kundoo		LC	Palei et al. 2011; Lahkar et al.2015
115	Black-naped Oriole	Oriolus chinensis		LC	Lahkar et al.2015
Passer	iformes: Dicruridae				
116	Black Drongo	Dicrurus macrocercus	S1, S2, S3, S4	LC	Palei et al. 2011; Lahkar et al.2015
117	White-bellied Drongo	Dicrurus caerulescens	S1, S2, S3, S4	LC	Palei et al. 2011; Lahkar et al.2015
118	Ashy Drongo	Dicrurus leucophaeus		LC	Palei et al. 2011
119	Greater Racket-tailed Drongo	Dicrurus paradiseus		LC	Palei et al. 2011
120	Lesser racket-tailed drongo	Dicrurus remifer		LC	Lahkar et al.2015
Passer	iformes: Rhipiduridae				
121	White-browed Fantail	Rhipidura aureola	S1	LC	*
122	White-throated Fantail	Rhipidura albicollis		LC	Palei et al. 2011
Passer	iformes: Monarchidae				
123	Black-naped Monarch	Hypothymis azurea	S1, S3	LC	Palei et al. 2011; Lahkar et al.2015

124	Indian Paradise- Flycatcher	<i>Terpsiphone paradise</i> S1 L		LC	Palei et al. 2011
Passer	iformes: Corvidae				
125	Rufous Treepie	Dendrocitta vagabunda	S1, S2, S3, S4	LC	Palei et al. 2011; Lahkar et al.2015
126	House Crow	Corvus splendens	S1, S2, S3, S4	LC	Palei et al. 2011
127	Large-billed Crow	Corvus macrorhynchos	S1	LC	Palei et al. 2011; Lahkar et al.2015
Passer	iformes: Alaudidae				
128	Rufous-tailed lark	Ammomanes phoenicura	S1, S2, S3, S4	LC	*
129	Oriental Sky Lark	Alauda gulgula	S4	LC	*
130	Ashy-crowned Sparrow Lark	Eremopterix griseus		LC	Lahkar et al.2015
Passer	iformes: Hirundinidae				
131	Striated swallow	Cecropis striolata	S1, S4	LC	*
132	Red-rumped swallow	Cecropis daurica	S4	LC	*
133	Wire-tailed Swallow	Hirundo smithii	S1, S4	LC	Lahkar et al.2015
134	Barn Swallow	Hirundo rustica	ica LC		Lahkar et al.2015
Passer	iformes: Timaliidae				
135Indian Scimitar Babbler		Pomatorhinus horsfieldii		LC	Lahkar et al.2015
Passeriformes: Leiothrichidae					
136	Jungle Babbler	Argya striata	S1, S4	LC	Palei et al. 2011; Lahkar et al.2015
137	Scrub Babbler	Argya caudata		LC	Palei et al. 2011
Passer	iformes: Sittidae				
138	Chestnut-bellied Nuthatch	Sitta cinnamoventris	S1, S4	LC	Lahkar et al.2015
Passer	iformes: Pycnonotidae				
139	Red-vented Bulbul	Pycnonotus cafer	S1, S2, S3, S4	LC	Palei et al. 2011; Lahkar et al.2015
140	Red-whiskered Bulbul	Pycnonotus jocosus	S1, S2, S4	LC	Palei et al. 2011
141	Black-headed Bulbul	Brachypodius atriceps		LC	Lahkar et al.2015
Passer	iformes: Phylloscopidae				
142	Sulphur-bellied Warbler	Phylloscopus griseolus	S1	LC	*
143	Hume's Leaf Warbler	Abrornis humei		LC	Lahkar et al.2015
144	Dusky Warbler	Phylloscopus fuscatus		LC	Lahkar et al.2015
145	Common Chiffchaff	Phylloscopus collybita		LC	Lahkar et al.2015
Passer	iformes: Cisticolidae				
146	Common Tailorbird	Orthotomus sutorius	S1, S2, S3, S4	LC	*
147	Gray-breasted Prinia	Prinia hodgsonii	S1	LC	Palei et al. 2011; Lahkar et al.2015

148	Plain Prinia	Prinia inornata	S1, S2, S4	LC	Palei et al. 2011; Lahkar et al.2015
149	Jungle Prinia	Prinia sylvatica		LC	Palei et al. 2011
150	Ashy Prinia	Prinia socialis		LC	Lahkar et al.2015
151	Zitting Cisticola	Cisticola juncidis		LC	Lahkar et al.2015
Passer	iformes: Acrocephalidae				
152	Clamorous Reed Warbler	Acrocephalus stentoreus		LC	Lahkar et al.2015
Passer	iformes: Zosteropidae				
153	Oriental White-eye	Zosterops palpebrosus	S1, S2, S3, S4	LC	Lahkar et al.2015
Passer	iformes: Muscicapidae				
154	Indian Robin	Copsychus fulicatus	S1, S2, S3, S4	LC	Palei et al. 2011; Lahkar et al.2015
155	Oriental Magpie-Robin	Copsychus saularis	S1, S2, S3, S4	LC	Palei et al. 2011; Lahkar et al.2015
156	White-rumped Shama	Kittacincla malabarica		LC	Palei et al. 2011
157	Black Redstart	Phoenicurus ochruros		LC	Lahkar et al.2015
158	Pied Bushchat	Saxicola caprata	Saxicola caprata S1 LC		*
159	Brown-breasted Flycatcher	Muscicapa muttui S1		LC	*
160	Asian Verditer Flycatcher	Eumyias thalassinus	s LC		Lahkar et al.2015
161	Tickell's Blue Flycatcher	Cyornis tickelliae	LC		Lahkar et al.2015
Passer	iformes: Turdidae				
162	Orange-headed Thrush	Geokichla citrina	S1, S4	LC	Lahkar et al.2015
Passer	iformes: Sturnidae				
163	Asian Pied Starling	Gracupica contra	S1, S2, S3, S4	LC	Lahkar et al.2015
164	Brahminy Starling	Sturnia pagodarum	S1, S2, S3, S4	LC	Lahkar et al.2015
165	Chestnut-tailed Starling	Sturnia malabarica	S1, S2, S3, S4	LC	*
166	Common Myna	Acridotheres tristis	S1, S2, S3, S4	LC	Palei et al. 2011; Lahkar et al.2015
167	Hill Myna	Gracula religiosa		LC	Palei et al. 2011
168	Jungle Myna	Acridotheres fuscus		LC	Palei et al. 2011
Passer	iformes: Chloropseidae				
169	Asian Fairy-bluebird	Irena puella		LC	Lahkar et al.2015
170	Jerdon's Leafbird	Chloropsis jerdoni	S1, S2, S3, S4	LC	Palei et al. 2011; Lahkar et al.2015
171	Golden-fronted Leafbird	Chloropsis aurifrons		LC	Palei et al. 2011; Lahkar et al.2015

Passeri	iformes: Dicaeidae				
172	Thick-billed Flowerpecker	Dicaeum agile	S1, S4	LC	*
173	Pale-billed Flowerpecker	Dicaeum erythrorhynchos	S1	LC	*
Passeri	iformes: Nectariniidae				
174	Purple-rumped Sunbird	Leptocoma zeylonica	S1, S2, S3, S4	LC	Palei et al. 2011; Lahkar et al.2015
175	Purple Sunbird	Cinnyris asiaticus	S1, S2, S3	LC	Palei et al. 2011; Lahkar et al.2015
176	Crimson Sunbird	Aethopyga siparaja		LC	Palei et al. 2011
177	Little Spiderhunter	Arachnothera longirostra		LC	Lahkar et al.2015
Passeri	iformes: Motacillidae				
178	White Wagtail	Motacilla alba	S1, S2, S3, S4	LC	Palei et al. 2011; Lahkar et al.2015
179	White-browed Wagtail	Motacilla maderaspatensi	S1, S2, S3, S4 LC		Palei et al. 2011; Lahkar et al.2015
180	Forest Wagtail	Dendronanthus indicus	endronanthus indicus		Palei et al. 2011; Lahkar et al.2015
181	Yellow Wagtail	Motacilla flava		LC	Palei et al. 2011
182	Grey Wagtail	Motacilla cinerea		LC	Palei et al. 2011; Lahkar et al.2015
182	Paddyfield Pipit	Anthus rufulus	S1, S2, S3, S4	LC	Palei et al. 2011; Lahkar et al.2015
184	Olive-backed Pipit	Anthus hodgsoni	S4	LC	*
185	Tree Pipit	Anthus trivialis		LC	Palei et al. 2011
Passeri	iformes: Paridae				
186	Cinereous Tit	Parus cinereus		LC	Palei et al. 2011; Lahkar et al.2015
Passeri	iformes: Passeridae				
187	Chestnut-shouldered Bush Sparrow	Gymnoris xanthocollis	S1, S3, S4	LC	*
188	House Sparrow	Passer domesticus	S1	LC	Palei et al. 2011
Passer	iformes: Estrildidae				
189	Indian Silverbill	Euodice malabarica	S1, S4	LC	Palei et al. 2011
190	Black-headed Munia	Lonchura malacca		LC	Palei et al. 2011
191	Scaly-breasted Munia	Lonchura punctulata		LC	Palei et al. 2011; Lahkar et al.2015
192	White-rumped Munia	Lonchura striata	S1, S2	LC	Palei et al. 2011



Figure 2: View of Patora dam



Figure 3: View of Tikrapada site



Figure 4: View of Maraguda wetland





Figure 5: Some photographic records of birds in Sunabeda Wildlife Sanctuary: A- Tufted Duck (*Aythya fuligula*), B- Little Cormorant (*Phalacrocorax niger*), C- Great Cormorant (*Phalacrocorax carbo*), D- Purple Heron (*Ardea purpurea*), E- Intermediate Egret (*Mesophoyx intermedia*), F- Indian Black Ibis (*Pseudibis papillosa*), G- Osprey (*Pandion haliaetus*), H- Black-shouldered Kite (*Elanus caeruleus*), I- Crested Serpent-Eagle (*Spilornis cheela*), J-Rufous-bellied Eagle (*Lophotriorchis kienerii*), K- Shikra (*Accipiter badius*), L- Oriental honey buzzard (*Pernis ptilorhynchus*), M- Purple Swamphen (*Porphyrio porphyrio*), N- Common Moorhen (*Gallinula chloropus*), O- Little Ringed Plover (*Charadrius dubius*), P- Common Sandpiper (*Actitis hypoleucos*), Q- Wood Sandpiper (*Tringa glareola*), R- Small Pratincole (*Glareola lacteal*), S- Whiskered Tern (*Chlidonias hybrid*), T- Eurasian Collared-Dove (*Streptopelia decaocto*)

Photo Credit: A Payra, S K Dash, G S Udgata



Figure 6: Some photographic records of birds in Sunabeda Wildlife Sanctuary: A- Spotted-necked Dove (*Streptopelia chinensis*), B- Laughing Dove (*Streptopelia senegalensis*), C- Yellow-footed Pigeon (*Treron phoenicopterus*), D- Sirkeer Malkoha (*Phaenicophaeus leschenaultia*), E- Indian Gray Hornbill (*Ocyceros birostris*), F- White-throated Kingfisher (*Halcyon smyrnensis*), G- Blue-tailed Bee-eater (*Merops philippinus*), H- Indian Roller (*Coracias benghalensis*), I- Coppersmith Barbet (*Psilopogon haemacephalus*), J- Brown-headed Barbet (*Psilopogon zeylanicus*), K- Plum-headed Parakeet (*Psittacula cyanocephala*), L- Common Woodshrike (*Tephrodornis pondicerianus*), M- Common Iora (*Aegithina tiphia*), N- Small Minivet (*Pericrocotus cinnamomeus*), O- Long-tailed shrike (*Lanius schach*), P- Black-hooded Oriole (*Oriolus xanthornus*), Q- White-browed Fantail (*Rhipidura aureola*), R- Black-naped Monarch (*Hypothymis azurea*), S- Indian Paradise-Flycatcher (*Terpsiphone paradise*), T- Rufous-tailed lark (*Ammomanes phoenicura*)

Photo Credit: A Payra, S K Dash, G S Udgata)

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Figure 7: Some photographic records of birds in Sunabeda Wildlife Sanctuary: A- Oriental Sky Lark (*Alauda gulgula*), B- Wire-tailed Swallow (*Hirundo smithii*), C- Striated swallow (*Cecropis striolata*), D- Chestnut-bellied Nuthatch (*Sitta cinnamoventris*), E- Sulphur-bellied Warbler (*Phylloscopus griseolus*), F- Gray-breasted Prinia (*Prinia hodgsonii*), G- Oriental White-eye (*Zosterops palpebrosus*), H- Indian Robin (*Copsychus fulicatus*), I- Brown-breasted Flycatcher (*Muscicapa muttui*), J- Brahminy Starling (*Sturnia pagodarum*), K- Jerdon's Leafbird (*Chloropsis jerdoni*), L- Thick-billed Flowerpecker (*Dicaeum agile*), M- Pale-billed Flowerpecker (*Dicaeum erythrorhynchos*), N- Purple Sunbird (*Cinnyris asiaticus*), O- Purple-rumped Sunbird (*Leptocoma zeylonica*), P- Paddyfield Pipit (*Anthus rufulus*), Q- Olive-backed Pipit (*Anthus hodgsoni*), R- Chestnut-shouldered Bush Sparrow (*Gymnoris xanthocollis*), S- Indian Silverbill (*Euodice malabarica*), T- White-rumped Munia (*Lonchura striata*)

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