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STATUS OF THE WATERBIRDS OF SUNABEDA WILDLIFE SANCTUARY, ODISHA, INDIA

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ABSTRACT

Population study of water birds was conducted in two wetlands 'Raital Bandh' and 'Jalkil Bandh' of the Sunabeda Wildlife Sanctuary, Odisha, India, in two successive years 2009 and 2010. 4,701 birds of 29 species belonging to 12 families were recorded during two years. Highest number of waterbirds were observed in Raital Bandh during both years. All total eight winter and twenty one resident species were identified during the study period. The family *Anatidae* (46.67% and 51.30%) in Raital Bandh and 60.79% and 58.14% respectively in Jalkil Bandh forms the main bulk of the waterbirds population. Species diversity was found highest in Raital Bandh in 2009 (1.398) and in 2010 Jalkil Bandh (1.342). The depth of the water and siltation was the major problem in winter of these two wetlands. Illegal activities like netting, killing of wild birds are continuously major threats for the conservation.

Key words: Water birds, Population, Conservation threats

Introduction

Wetlands are the most threatened habitats because of their vulnerability and attractiveness for development (Hollis *et al.,* 1988). Birds are the good bio-indicatiors and useful models for studying a variety of environmental problems (Urfi *et al.*, 2005). Wetlands in India occupy 58.2 million hectares, including areas under wet paddy cultivation (Prasad *et al.,* 2002). The fresh water wetlands alone support 20% of the known range of biodiversity in India (Deepa and Ramachandra, 1999). Measures of species diversity play a central role in ecology and conservation biology (Noss and Cooperrider, 1994; Krebs, 1999).

Accordingly, the relationship between distribution and abundance has important implications for measures of species diversity and community structure. The most commonly employed measures of species diversity are species richness and those based on species frequencies involving Shannon information and Simpson concentration, with community abundance structure then measured by evenness (Krebs, 1999).

A few studies have been conducted on the population status and distribution of avifauna in context to Odisha (Murthy and Rao, 1989; Sahu and Rout, 2005; Ambastha, 2005; Nair, 2007; Gopi and Pandav, 2006). Few studies were also done on the breeding and nesting biology (Sing *et al.,* 2001; Gopi and Pandav, 2006b; Gopi and Pandav, 2007; Sathiyaselvam and Balachandan, 2007).

In the present study we investigated the population status and diversity of waterbirds of Sunabeda Wildlife Sanctuary. Mid-winter waterbird census data were also incorporated with the result. However, this is the first scientific documentation of the diversity and abundance of waterbirds in Sunabeda Wildlife Sanctuary. Our study was restricted in two wetlands viz Raital Bandh and Jalkil Bandh, which constitute the major waterbird population in the Sanctuary.

Material and Methods

Study Area

Sunabeda Wildlife Sanctuary is situated between longitude $82^0$20'00''E and $82^0$34'42''E and Latitude $20^0$24'N and $24^0$44'N is located in the Nuwapada District of Odisha. It was declared as Wildlife Sanctuary in the year 1983 with total geographical area of 600 Km^2. Sunabeda Wildlife Sanctuary falls in the Deccan Peninsular Zone of the Indian Biogeographical zone and Eastern Plateau province and Chhatishgarh-Dandakaranya sub-division. The Wildlife Sanctuary is sharing common border with the state of Chattisgarh. Winter starts from middle of November and last of up to the end of February. The maximum rainfall is 1100 to 1500 mm. The temperature ranges from 12^o to 40^o C.

Methodology

Study on the water birds diversity and population status at Jalkil Bandh and Raital Bandh of Sunabeda Wildlife Sanctuary was carried out mainly during the mid-winter waterbird count which occurred mainly in the month of February. The data were collected in 2009 and

Twenty nine (29) species of water birds belonging to 12 families were identified among 4,701 individual counted during 2009 and 2010 in Raital and Jalkil water bodies.

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Table 1 : Population of water birds in Raital Bandh and Jalkil Bandh of Sunabeda Wildlife Sanctuary recorded from 2009-2010

Sl. No.	Family	Species	Raital Bandh		Jalkil Bandh	
			2009	2010	2009	2010
1.	Podicipedidae	Little Grebe *Tachybaptus ruficollis*	0	0	0	13
2.	Phalacrocoracidae	Little Cormorant *Phalacrocorax niger*	23	8	10	16
3.		Great Cormorant *Phalacrocorax carbo*	0	1	0	0
4.	Anhingidae	Darter *Anhinga melanogaster*	4	0	0	0
5.	Ardeidae	Little Egret *Egretta garzetta*	55	35	12	86
6.		Purple Heron *Ardea purpurea*	4	3	6	3
7.		Cattle Egret Bubulcus ibis	45	46	0	26
8.		Large Egret *Casmerodius albus*	1	0	0	0
9.		Median Egret Mesophoyx intermedia	7	21	58	120
10.		Indian Pond Heron *Ardeola grayii*	13	5	0	8
11.	Ciconiidae	Asian Openbill-stork *Anastomus oscitans*	43	12	0	12
12.	Anatidae	Lesser Whistling Duck *Dendrocygna javanica*	460	430	252	231
13.		Brahminy Shelduck *Tadorna ferruginea*	22	40	0	36
14.		Gadwall *Anas strepera*	32	150	0	101
15.		Northern Pintail *Anas acuta*	142	105	31	108
16.		Common Teal *Anas crecca*	80	41	0	25
17.		Commmon Pochard *Aythya ferina*	0	0	0	58
18.		Cotton Teal *Nettapus coromandelianus*	0	0	52	69
19.	Pandionidae	Osprey Pandion haliaetus	1	1	0	0
20.	Ralidae	White-breasted Waterhen *Amaurornis phoenicurus*	13	3	0	4
21.		Purple Moorhen *Porphyrio porphyrio*	230	305	50	54
22.		Common Moorhen *Gallinula chloropus*	120	101	42	34
23.		Common Coot *Fulica atra*	120	102	20	43
24.	Jacanidae	Pheasent-tailed Jacana *Hydrophasianus chirurgus*	20	3	10	6
25.		Bronze-winged Jacana *Metopidius indicus*	18	8	6	4
26.	Charadridae	Little-ringed Plover *Charadrius dubius*	22	11	0	0
27.		Red-wattled Lapwing *Vanellus indicus*	20	10	2	23
28.	Scolopacidae	Common Sandpiper *Actitis hypoleucos*	41	21	0	0
29.	Glareolidae	Small Pratincole *Glareola lactea*	41	31	0	0

Table 2 : Birds of Sunabeda Wildlife Sanctuary, Odisha 2009-2010 and their status

Sl. No.	Species	Status	Remarks
1	Little Grebe *Tachybaptus ruficollis*	R/LC	Less abundant and only recorded in Jalkil Bandh
2	Little Cormorant *Phalacrocorax niger*	R/C	Less abundant.
3	Great Cormorant *Phalacrocorax carbo*	R/LC	Less abundant.
4	Darter *Anhinga melanogaster*	R/R	Less abundant, once recorded in Raital Bandh
5	Little Egret *Egretta garzetta*	R/C	Less abundant.
6	Purple Heron *Ardea purpurea*	R/C	Less abundant
7	Cattle Egret *Bubulcus ibis*	R/C	Less abundant.
8	Large Egret *Casmerodius albus*	R/LC	Less abundant and only recorded in Raital Bandh in2009
9	Median Egret *Mesophoyx intermedia*	R/C	Abundant.
10	Indian Pond Heron *Ardeola grayii*	R/C	Less abundant
11	Asian Openbill-stork *Anastomus oscitans*	R/C	Less abundant
12	Lesser Whistling Duck *Dendrocygna javanica*	R/C	Very abundant
13	Brahminy Shelduck *Tadorna ferruginea*	WV/C	Less abundant and Regular Winter visitor.
14	Gadwall *Anas strepera*	WV/C	Abundant and Regular winter visitor
15	Northern Pintail *Anas acuta*	WV/C	Abundant and Regular winter visitor
16	Common Teal *Anas crecca*	WV/LC	Less abundant and Regular winter visitor
17	Common Pochard *Aythya ferina*	WV/?	Less abundant, First time recorded in 2010 at Jalkil Bandh
18	Cotton Teal *Nettapus coromandelianus*	R/C	Less abundant
19	Osprey *Pandion haliaetus*	WV/R	Less abundant, only sighted near dame
20	White-breasted Waterhen *Amaurornis phoenicurus*	R/C	Less abundant
21	Purple Moorhen *Porphyrio porphyrio*	R/C	Very abundant
22	Common Moorhen *Gallinula chloropus*	R/C	Abundant
23	Common Coot *Fulica atra*	WV/C	Abundant and regular winter visitor
24	Pheasent-tailed Jacana *Hydrophasianus chirurgus*	R/C	Less abundant
25	Bronze-winged Jacana *Metopidius indicus*	R/C	Less abundant
26	Little-ringed Plover *Charadrius dubius*	R/LC	Less abundant and Regular winter visitor, sighted near dam
27	Red-wattled Lapwing *Vanellus indicus*	R/C	Less abundant
28	Common Sandpiper *Actitis hypoleucos*	WV/LC	Less abundant and regular winter visitor, Recorded near dam
29	Small Pratincole *Glareola lactea*	R/LC	Less abundant, recorded near dam

Abbreviation: *C =Common ,*LC =Less Common ,*R =Rare ,*WV =Winter Visitor ,?=observed only once .

*For classifying status additional Forest Dept .data were used from 2006-2008 along with the authors data .

Abundant= <200 individuals in both the year. Very abundant= <500 individuals in both the year. Less abundant= >200 individuals in both the year.

2010. Regular surveys at monthly intervals from December to March (in 2009 and 2010) were also undertaken. Binocular with 8x40 and 12x50 were used and for identification field guide (Grimmitt *et al.,* 1999) was used. The nomenclature and systematic sequence of birds as given by Manakadan and Pittie (2001) was used. Per cent occurrence was estimated according to Basavarajappa (2006). Data were analyzed with Bio-diversity Programme version-2.

Results and Discussion

In total, 4,701 individuals of 29 species of wetland birds belonging to 12 families were counted from Raital Bandh and Jalkil Bandh (Table 1). Our list comprises of 8 winter visitors and 21 residents (Table 1).

A variety of waterbirds and aquatic flora were found in Raital Bandh and Jalkil Bandh wetland of Sunabeda Wildlife Sanctuary. The wetlands are surrounded by dry deciduous forest with varieties of bushes and herbs. But the flora of this region is yet to be studied. The observed waterbirds during our study period (2009-2010) were summarized in Table 2 and average estimated populations of waterbirds in Raital Bandh and Jalkil Bandh in two successive years (2009-2010) were listed in Table-1. The number of all wintering species varied in Raital Bandh, 25 species in 2009 and 24 species in 2010 and in Jalkil Bandh, 13 species in 2009 and 22 species in 2010. The comprehensive study of waterbirds has revealed that there were altogether 28 species in Raital Bandh and 25 species in Jalkil Bandh along with the adjoining areas. Percentage of members of family *Anatidae* was 46.67% and 51.30% respectively in two successive the years in Raital Bandh and 60.79% and 58.14% respectively in two successive the years in Jalkil Bandh forms the main bulk of the waterbirds population in both the wetlands. The highest congregated species observed in Raital Bandh was lesser whistling duck (29.16% in 2009 and 27.26% in 2010) followed by Purple Moorhen (14.58% in 2009 and 20.42% in 2010) and Northern Pintail (9.0% in 2009 and 7.03% in 2010) and in Jalkil Bandh was lesser whistling duck (45.73% in 2009 and 21.39% in 2010) followed by median egret (10.52% in 2009 and 11.11% in 2010) and northern pintail (5.62% in 2009 and 10% in 2010) of the total population (Fig. 1).

Per cent occurrence found in the families was also varied in both years in both the wetlands. In Raital Bandh

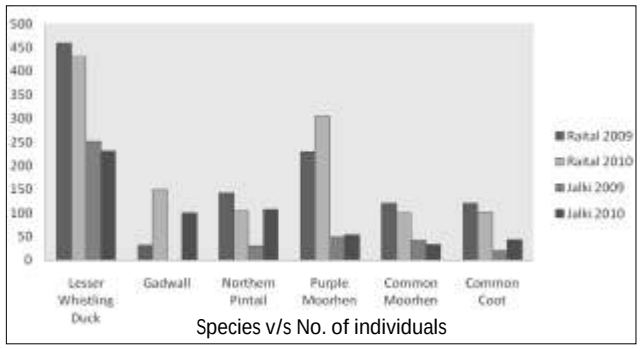

Fig:1 : highest congregation of individuals belonging to most common water birds species recorded in Raital bandh and Jalki bandh in 2009 and 2010

family-wise proportion of species richness was found highest in *Ardeidae* (20.68% in 2009 and 17.24% in 2010), followed by *Anatidae* (17.24% in both years) and *Ralidae* (13.79% in both years). And in Jalkil Bandh species richness was found highest in *Anatidae* (10.34% in 2009 and 24.13% in 2010), followed by *Ardeidae* (10.34% in 2009 and 17.24% in 2010) and *Ralidae* (10.34% in 2009 and 13.79% in 2010). The rarefunction plot shows that the species diversity is increasing, so it is recommended that the further study is necessary to find out appropriate diversity (Fig. 2).

Species diversity was found highest in Raital Bandh during 2009 (1.398) followed by in Jalki Bandh 2010 (1.342) using Shannon Hmax Log Base 10. (Table 3). Species richness is found to be high in Jalki Bandh in 2010 (29) followed by 2009 (28.6) and in Raital Bandh in 2010 (26.4).

Conclusion

Sunabeda Wildlife Sanctuary harbour good habitat for the avifauna. The present study provided a very preliminary database which would be taken as a baseline for further study.

The species diversity remains constant in Raital bandh but again without any long term study it would be difficult to conclude. In case of Jalki bandh the diversity of waterbirds become increasing. One of the major factor could be the continuous renovation of the area and new conservation policies were being introduced by park management. Second factor could be the availability of water throughout the year. The waterbird population and diversity is highly depending upon the water content (depth, salinity, aquatic vegetation, etc) so, water parameters play an important role in the species

Table 3 : Species diversity of Raital bandh and Jalki bandh in 2009 and 2010 using Program Bio-diversity.

Index	Raital		Jalki	
	2010	2009	2010	2009
Shannon H' Log Base 10.	1.073	0.994	0.808	1.133
Shannon Hmax Log Base 10.	1.398	1.380	1.114	1.342
Shannon J'	0.768	0.720	0.726	0.844

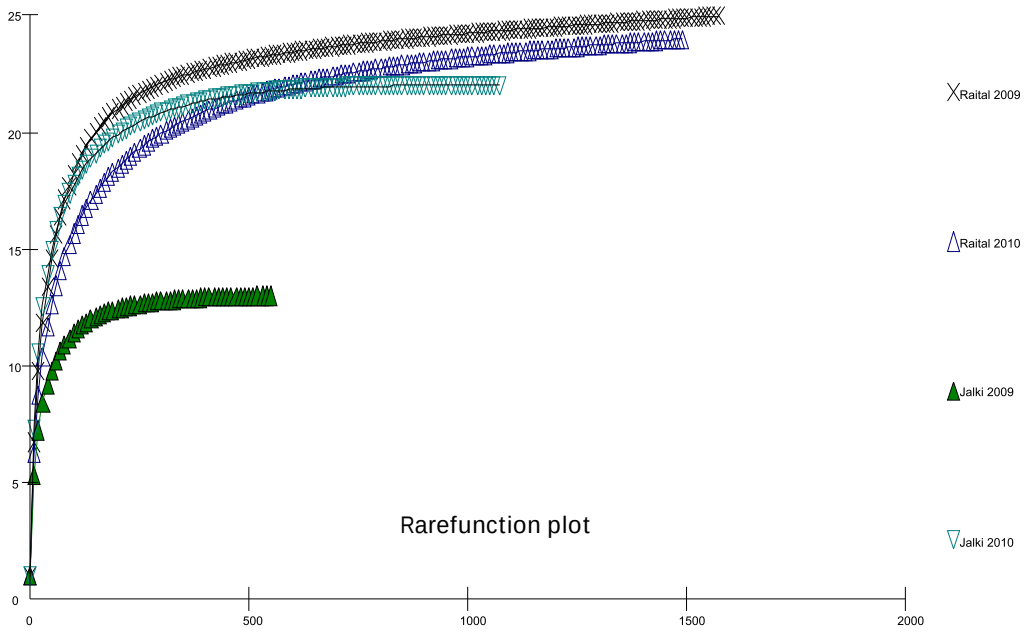

Fig. 2 : Rarefanction plot of Jalki bandh and Raital bandh 2009 & 2010

composition. The wetlands were previously full of water hyacinth and other aquatic flora but when the open water increases the diversity become increased remarkably. The rarefanction graph shows that the population become open, so more rigorous and continuous study is recommended to find out the actual population size.

The depth of the water and siltation was the major problem in winter of these two wetlands. As a part of management practices, Raital bandh is connected to the nearby Patora dam through an artificial canal to facilitated water round the year. Some artificial earthen mounts were prepared around the northern border of the wetland for the water birds especially Anatidaes for perching. Illegal activities like netting, killing of wild birds are continuously a major problem for the conservation.

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सनवेदा वन्यजीव अभ्यारण, उड़ीसा (भारत) में जलपक्षियों की स्थिति

दीपांकर लहकर, एच.के. साहू तथा एस. रहमान

सारांश

हमने वर्ष 2009 तथा 2010 में सनवेदा वन्यजीव अभ्यारण, उड़ीसा (भारत) की दो तरभूमियों यथा: रैताल बंध और जलकिल बांध में जल पक्षियों की आबादी का अध्ययन किया। हमने दो वर्षों में 12 कुलों की 29 प्रजातियों की 4701 एकलों की गणना की। दोनों वर्षों में रैताल बांधा में जल पक्षियों की अधिकतम संख्या पाई गई। अध्ययन अवधि में कुल मिलाकर आठ शीतकालीन तथा इक्कीस निवासी प्रजातियों की पहचान की गई। रैताल बांध में एनाटीडाई कुल की (46.67% और 51.30%) तथा जलकिल बांध की (60.79% और 58.14%) जलपक्षियों का मुख्य समूह था। रैताल बांध में वर्ष 2009 में (1.398) तथा जलकिल बांध में (1.342) अधिकतम प्रजाति वैविध्य पाया गया। इन दोनों तरभूमियों में सर्दियों में पानी की गहराई और गादीकरण मुख्य समस्या थी। पक्षियों को जाल में फंसाना और मारना, इनके संरक्षण के लिए मुख्य समस्यायें बनी हुई हैं।

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