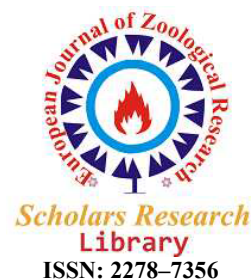




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Seasonal Variation of Avifauna in Hygam Wetland of Kashmir Valley

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ABSTRACT

The current study provides important information about the seasonal variations in aquatic birds in Haigam wetland. A total of 24 species of aquatic birds belonging to 8 orders showed variations for a period of two years (April 2012- March 2014). The aquatic birds showed an interesting pattern of fluctuations in the wetland and during these periods three categories of birds viz. resident, summer and winter migratory birds were noticed. Hence, the present study shows migration of different kinds of aquatic birds which needs regular monitoring to check anthropogenic activities.

Keywords: Aquatic birds; Seasonal variation; Conservation

INTRODUCTION

The wetlands are complex communities of living organisms which integrate them with their physical environment. They have been productive in nature and one of the important components of the ecosystem and been the most important food sources for animals especially for birds. Wildlife biologists have been very much interested in the study of wetland ecology including Shaw and Fredin [1], Stewart and Kantrud [2], Cowardin and Johnson [3], Jaglum et al. [4], Cowardin et al. [5]. Beecher [6] was the first to study the wetland vegetation substrates in relation to bird nesting and showed that number of bird nets was positively correlated with number of plant species. Wetlands in India cover an area of 58.2 million hectares, Prasad et al. [7] and approximately 23% (310 of 1340) of the bird species found in India, Manakadan and Pittie [8] are known to be dependent on wetlands, Kumar et al. [9].

The Jammu and Kashmir state is rich in natural resources particularly in wetlands. Wetlands of Kashmir valley provide wintering resort to millions of migratory birds particularly the waterfowl (ducks, geese and swans) and conducive breeding grounds to a segment of resident and non-resident summer migrants (Shamim et al.) [10]. A total of 300 bird species have been documented from Jammu and Kashmir, which includes both resident and non-residents Ali and Ripley [11]. Of these, Bates and Lowther [12] have already listed some 102 species of breeding birds in their book "Breeding Birds of Kashmir". Shah [13] has recorded 90 species of birds both resident and non-resident from Hokarsar wetland and 92 species have been listed by Holmes and Parr [14] from Hygam wetland. Kashmir valley wetlands are facing increased environmental threats due to manmade activities viz. eutrofication, siltation, agriculture conversion, overfishing, habitat destruction etc. These wetlands are important breeding and roosting sites for a large number of resident and non-resident birds. The overall population of birds has declined both quantitatively and qualitatively. Keeping in view the above discussion, the present study was undertaken to study the migration and documentation of aquatic birds in this wetland and suggest proper management measures to save this wetland.

MATERIAL AND METHODS

Hygam is one of the important wetlands of the Kashmir valley which is protected and managed by the Department of Wildlife Protection of the state. It is the ideal place for a large number of both residents and non-resident birds. The wetland is located about 39 km to north-west of the Srinager city and at a distance of 2 km south-east from the National High Way. The wetland with an area of 9.5 sq km is oval in shape located between 34.20-34.50° N latitude

and 74.50-90° E longitude at an altitude of 1585 m above sea level (Figure 1). For bird population estimation, the methods of Gaston were used [11,15]. The whole wetland was divided into 4 transects and each transect was divided into 4 quarters. The total number of birds seen in each quadrat was counted inside the shooting butts (bird shooting sites) and recorded separately. An average of 30 minutes was spent for each quadrat. A minimum of two counts were made in each block every block every month and the standard estimated counts were thus calculated as average of the two.

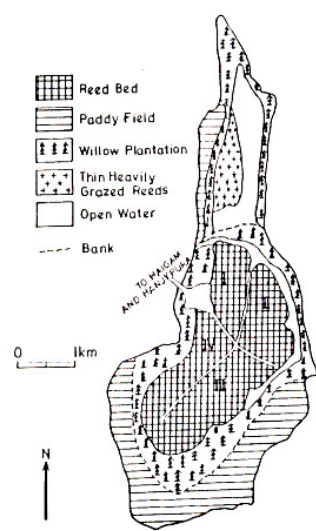


Figure1: Map showing the study area of Haigam wetland.

Table 1: Monthly density of Resident Birds in Hygam wetland during the year April 2012 to March 2013.

S.No	Species	Local Name	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total	% Age
1	Dabchick	Pindh	88	96	118	78	52	12	45	60	46	58	67	90	810	0.85
2	Eastern Grey heron	Brag	14	13	9	10	23	20	20	28	36	29	16	11	229	0.24
3	Indian Pond heron	Brock	20	13	18	15	38	28	42	26	7	12	18	21	258	0.27
4	Night heron	Bor	23	26	26	17	29	19	22	16	16	20	32	18	264	0.28
5	Himalayan griffon vulture	Grad	3	-	-	-	3	-	-	-	1	-	1	2	10	0.01
6	Common pariah kite	Ghant	15	16	18	16	27	31	25	20	14	14	8	12	216	0.23
7	House crow	Kaw	150	120	75	106	130	96	280	285	560	920	860	208	3790	3.97
8	Himalayan jungle crow	Jangle Kaw	4	-	-	-	-	-	-	12	28	17	32	28	121	0.13
9	Eastern jackdaw	Kawin	310	160	80	120	180	400	770	1260	2800	2260	1590	840	10770	11.28
10	White cheeked Bulbul	Bulbul	16	18	8	72	30	30	22	6	-	-	-	-	202	0.21
11	Common Myna	Har	42	46	47	45	60	102	232	60	40	32	46	42	794	0.83
12	Kashmiri house sparrow	Tsar and Kantur	180	152	160	120	430	1800	3200	2600	220	800	200	210	10072	10.55
13	Fantail snipe	Chah	28	29	17	12	32	48	65	45	33	28	37	25	399	0.42
14	Common sand piper	TantKon	38	26	12	15	32	40	28	45	36	22	32	54	380	0.4
15	Little egret	Doda Brag	24	18	9	16	24	28	16	30	32	38	36	22	293	0.31
16	Small blue king fisher	Kaltonch	34	32	30	28	48	28	36	36	32	22	34	32	392	0.41
17	European little ringed plover	Kola Katiji	3	4	8	12	7	3	2	2	-	-	3	2	46	0.05
18	Hume's blue rock pigeon	Jangle Kotur	-	-	-	-	-	60	320	285	80	-	-	-	745	0.78
19	Kashmiri grey tit	Ranga Tsar	4	6	8	8	10	6	4	2	-	-	2	4	54	0.06
20	Scully's wood owl	Rata Mogul	-	-	-	-	-	-	-	-	1	-	-	-	1	0

Table 2: Monthly density of Resident Birds in Hygam wetland during the year April 2013 to March 2014.

S.No	Species	Local Name	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total	% Age
1	Dabchick	Pindh	74	80	105	60	55	10	35	70	45	50	60	78	722	0.79
2	Eastern Grey heron	Brag	12	8	10	7	20	18	18	25	35	30	14	10	207	0.23
3	Indian Pond heron	Brock	20	10	20	14	35	30	40	22	6	13	15	20	245	0.27
4	Night heron	Bor	22	20	25	19	35	20	18	15	12	18	19	23	246	0.27
5	Himalayan griffon vulture	Grad	-	-	-	-	-	-	-	1	-	-	2	1	4	0
6	Common pariah kite	Ghant	10	14	17	13	30	25	24	22	20	17	13	12	217	0.24
7	House crow	Kaw	115	130	90	110	120	80	315	310	600	810	760	210	3650	3.97
8	Himalayan jungle crow	Jangle Kaw	5	-	-	-	-	-	10	15	30	29	40	25	154	0.17
9	Eastern jackdaw	Kawin	300	200	120	150	190	510	710	1400	2500	2450	1610	920	11060	12.04
10	White checked Bulbul	Bulbul	13	15	19	25	50	28	21	7	-	-	-	7	185	0.2
11	Common Myna	Har	42	50	48	60	100	120	240	70	45	30	50	40	895	0.97
12	Kashmiri house sparrow	Tsar and Kantur	190	200	170	130	490	1500	2500	2400	300	700	400	310	9290	10.11
13	Fantail snipe	Chah	20	25	18	13	40	45	50	58	35	32	40	28	404	0.44
14	Common sand piper	Tant Kon	29	23	11	13	28	35	30	40	40	20	28	50	347	0.38
15	Little egret	Doda Brag	22	20	12	20	28	30	35	30	25	40	32	20	314	0.34
16	Small blue king fisher	Kaltonch	26	20	22	23	38	30	30	32	28	25	30	35	339	0.37
17	European little ringed plov	Kola Katiji	2	3	5	10	6	2	1	1	-	-	2	1	33	0.04
18	Hume's blue rock pigeon	Jangle Kotur	-	-	-	-	-	70	200	400	100	-	-	-	770	0.84
19	Kashmiri grey tit	Ranga Tsar	2	4	4	6	6	2	2	-	-	-	-	-	26	0.03
20	Scully's wood owl	Rata Mogul	-	-	-	-	-	-	-	-	1	-	1	-	2	0

Table 3: Monthly density of Summer Migrants in Hygam wetland during the April 2012 to March 2013.

S.No	Species	Local Name	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total	% Age
1	Little Bittern	Goi	18	22	18	20	32	28	8	-	-	-	-	-	146	0.15
2	Pheasant tailed Jaccana	Gundkav	2	4	8	8	12	8	-	-	-	-	-	-	42	0.04
3	Indian Moorhen	Tech	34	40	42	39	60	57	12	2	-	-	-	-	286	0.3
4	Black Winged Stilt	Longzyzet	25	24	17	33	55	28	36	18	-	-	-	-	236	0.25
5	Hodgson's pied wagtail	Pinchkain	40	76	90	62	120	96	42	-	-	-	-	-	526	0.55
6	Indian Whiskered tern	Kresh	86	162	167	120	200	180	120	-	-	-	-	-	1035	1.08
7	Indian pied Kingfisher	Dodahor	8	12	10	38	18	8	4	-	-	-	-	4	102	0.11
8	European Hoopoe	Satut	16	12	20	18	4	-	-	-	-	-	-	-	70	0.07
9	Ringdove	Kukil	58	95	90	156	72	178	200	40	-	-	-	-	889	0.93
10	Spotted dove	Tripoot	-	48	42	120	126	138	190	30	-	-	-	-	694	0.73
11	Gloden oriole	Poshnul	-	-	8	10	-	-	-	-	-	-	-	-	18	0.02
12	Tickle's thrush	Kastor	21	20	28	20	32	32	18	10	-	-	-	-	181	0.19
13	Red shank	Tont	21	21	17	22	22	22	6	-	-	-	-	-	131	0.14
14	Brown headed gull	Krind	30	28	16	20	38	28	12	10	-	-	-	-	182	0.19
15	Golden blacked woodpecker	Kuldader	12	7	13	20	4	4	-	-	-	-	-	-	60	0.06
16	White breasted Kingfisher	Godakhaw	-	10	15	16	20	17	10	-	-	-	-	-	88	0.09
17	Whistling thrush	Razalot	8	6	6	4	8	8	10	7	-	-	-	-	57	0.06
18	Yellow wagtail	LaderPinchkain	46	70	75	85	36	36	22	-	-	-	-	-	370	0.39
19	White wagtail	SafadPinchkain	36	50	60	50	42	42	28	-	-	-	-	12	320	0.34

20	Common swallow	Katch	40	62	48	26	-	-	-	-	-	-	-	-	176	0.18
21	Blue tailed bee eater	Nulikresh	5	7	10	8	5	5	4	1	-	-	-	-	45	0.05
22	Pradise fly catcher	Shah bulbul	2	4	8	6	4	4	2	-	-	-	-	30	0.03	
23	Eurasian lapwing	Greesemahraz	2	6	6	7	-	-	-	-	-	-	-	21	0.02	
24	Reed warbler	Kurkesh	90	110	120	140	125	90	60	30	15	-	-	780	0.82	
25	Eastern grey wagtail	Khakhdobibai	6	8	12	20	10	10	7	2	-	-	-	75	0.08	
26	Rufous backed Shrike	Harwatig	3	4	5	3	-	-	-	-	-	-	-	15	0.02	

Table 4: Monthly density of Summer Migrants in Hygam wetland during the year April 2013 to March 2014.

S.No	Species	Local Name	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total	% Age
1	Little Bittern	Goi	16	20	15	14	30	27	7	-	-	-	-	-	129	0.14
2	Pheasant tailed Jaccana	Gundkav	3	7	6	5	10	7	-	-	-	-	-	-	38	0.04
3	Indian Moorhen	Tech	30	35	40	36	65	55	10	-	-	-	-	-	271	0.29
4	Black Winged Stilt	Longzyzet	15	20	18	32	45	25	31	15	-	-	-	-	201	0.22
5	Hodgson's pied wagtail	Pinchkain	40	57	80	55	90	80	40	-	-	-	-	-	442	0.48
6	Indian Whiskred tern	Kresh	110	105	120	130	110	120	250	-	-	-	-	-	945	1.03
7	Indian pied Kingfisher	Dodahor	7	10	7	8	46	7	5	-	-	-	-	5	95	0.1
8	European Hoopoe	Satut	14	15	20	7	5	-	-	-	-	-	-	-	61	0.07
9	Ringdove	Kukil	96	110	90	160	75	180	250	30	-	-	-	15	1006	1.09
10	Spotted dove	Tripoot	28	52	48	130	70	110	200	25	-	-	-	-	663	0.72
11	Gloden oriole	Poshnul	5	-	7	10	7	-	-	-	-	-	-	4	33	0.04
12	Tickle's thrush	Kastor	20	25	20	35	50	30	15	8	-	-	-	9	212	0.23
13	Red shank	Tont	5	18	8	17	20	18	-	-	-	-	-	-	86	0.09
14	Brown headed gull	Krind	20	30	19	28	35	22	15	12	-	-	-	-	181	0.2
15	Golden blacked woodpecker	Kuldader	12	15	20	18	25	7	3	-	-	-	-	-	100	0.11
16	White breasted Kingfisher	Godakhaw	10	12	18	25	14	5	-	-	-	-	-	-	84	0.09
17	Whistling thrush	Razalot	-	8	7	5	5	7	9	4	-	-	-	-	45	0.05
18	Yellow wagtail	LaderPinchkain	50	65	80	85	50	30	20	-	-	-	-	-	380	0.41
19	White wagtail	SafadPinchkain	40	45	55	65	42	52	25	-	-	-	-	-	324	0.35
20	Common swallow	Katch	10	70	50	25	26	-	-	-	-	-	-	-	181	0.2
21	Blue tailed bee eater	Nulikresh	4	8	10	12	7	5	3	2	-	-	-	-	51	0.06
22	Pradise fly catcher	Shah bulbul	-	4	6	6	8	4	-	-	-	-	-	-	28	0.03
23	Eurasian lapwing	Greesemahraz	1	4	5	3	-	-	-	-	-	-	-	-	13	0.01
24	Reed warbler	Kurkesh	85	90	110	120	150	110	80	60	15	-	-	-	820	0.89
25	Eastern grey wagtail	Khakhdobibai	-	7	8	10	6	4	3	1	-	-	-	-	39	0.04
26	Rufous backed Shrike	Harwatig	2	3	4	6	5	2	1	-	-	-	-	-	23	0.03

Table 5: Monthly density of Winter Migrants in Hygam wetland during the year April 2012 to March 2013.

S.No	Species	Local Name	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total	% Age
1	Mallard	Nulig and Thuj	33	-	-	-	-	15	565	2760	3653	3210	1250	4000	15486	16.23
2	Pintail	Sukhpachan	226	-	-	-	-	180	473	1170	930	393	1240	2730	7342	7.69
3	Common Tail	Kues	1824	7	-	-	8	283	1490	2300	1860	1520	2160	3510	14962	15.68
4	Gadwal	Budun	852	-	-	-	-	130	625	1900	1210	1630	1280	2500	10127	10.61
5	Shoveller	Honk	290	3	-	-	-	85	985	470	110	50	193	1540	3726	3.9
6	Common Pochard	Krukh	31	-	-	-	-	-	-	26	25	16	115	272	485	0.51
7	Berahminy Duck	Tsaku	-	-	-	-	-	6	-	-	14	6	12	5	43	0.05
8	Weigon	Shirinibudum	112	-	-	-	-	31	165	237	225	16	240	250	1276	1.34

9	Tufted Duck	Tsaraw	112	-	-	-	-	-	30	42	300	-	360	390	1234	1.29
10	Coot	Koular	205	-	-	-	75	115	270	200	190	480	500	980	3015	3.16
11	Garganey Teal	Noar	40	-	-	-	10	225	94	14	6	5	65	67	526	0.55
12	Red Crusted Pochard	Tuar	12	-	-	-	-	5	6	-	-	-	10	50	83	0.09
13	White Eyed Pochard	Harwat	16	-	-	-	-	8	4	3	300	-	290	90	711	0.74

Table 6: Monthly density of Winter Migrants in Hygam wetland during the year April 2013 to March 2014.

S.No	Species	Local Name	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total	% age
1	Mallard	Nulig and Thuj	20	-	-	-	-	5	630	2500	3540	3800	1130	3570	15195	16.54
2	Pintail	Sukhpachan	210	-	-	-	-	200	450	1000	800	420	800	2030	5910	6.43
3	Common Tail	Kues	1220	7	-	-	-	170	1500	2350	1540	1470	2000	3800	14057	15.3
4	Gadwal	Budun	530	-	-	-	-	90	700	1880	1100	1530	1200	2400	9430	10.26
5	Shoveller	Honk	400	2	-	-	-	60	910	530	90	20	105	1500	3617	3.94
6	Common Pochard	Krukh	20	-	-	-	-	-	-	30	15	10	90	230	395	0.43
7	Berahminy Duck	Tsaku	-	-	-	-	-	5	3	-	15	3	10	7	43	0.05
8	Weigon	Shirinibudum	105	-	-	-	-	40	130	220	250	20	240	250	1255	1.37
9	Tufted Duck	Tsaraw	90	-	-	-	-	-	25	30	350	10	380	590	1475	1.61
10	Coot	Koular	350	-	-	-	100	250	370	380	260	500	320	1500	4030	4.39
11	Garganey Teal	Noar	45	-	-	-	8	230	98	20	-	-	65	70	536	0.58
12	Red Crusted Pochard	Tuar	5	-	-	-	-	-	-	-	-	12	8	30	55	0.06
13	White Eyed Pochard	Harwat	30	-	-	-	-	-	-	-	-	10	115	160	315	0.34

RESULTS AND DISCUSSION

During the present study, monthly density of resident, summer and winter bird population was analyzed for a period of two years (April 2012- March 2014) which is given in tables 1-6. During the present investigation, fluctuation was recorded in all selected sites with regard to resident (R), Summer (S) and Winter (W) birds. As far as resident birds are concerned, Eastern Jackdaw (11.28%) followed by House sparrow (10.55%) and least recorded was Scallys wood owl (0.00%) for a period of two years. But with regard to summer and winter bird migration, much fluctuation was recorded. As Indian whiskred tern (1.08%) and Rufus backed shrike (0.02%) was recorded for a period i.e., April 2012- March 2014. Similarly, Ringdove density was highest (1.09%) and Rufous backed shrike (0.03%) as lowest was recorded for a period. About 300 bird species have been recorded from Jammu and Kashmir (Ali and Ripley). Shah has recorded 90 species of both resident and non-resident birds from Hokarsar wetland and 92 species have been listed by Holmes and Parr from Hygam wetland. However, during the present investigation, there was a quite decline in the birds both quantitatively and qualitatively and a total of only 59 species of birds were recorded which included 20 species of residents (Tables 1 and 2), 26 species of summer migrants (Tables 3 and 4) and 13 species of winter migrants (Tables 5 and 6). This decline in number of bird species is related to the loss of habitat and illegal encroachment. The local people harvest the reeds for thatching and mat making when the nests of birds are full with clutch of eggs. Besides, the vegetation is used as a cattle feed and more severely the cattle is often driven into the wetland for feeding purposes. This has seriously affected the bird behavior and their habitat use and compelled them to choose some safer nesting, roosting and feeding places outside the wetland. Shah [13] also documented that availability of food resources, suitable roosting and nesting as well as behavioral spacing mechanism which is factors of major significance that regulate the population of birds. This could be related to the overall change in the ecology of the wetlands also [13]. This observation is also supported by Khan et al. [16]. Besides the anthropogenic activities, the natural climatic and weather conditions also influence the population structure of the birds. During winter months of January there was a drastic decline in population of birds in general and waterfowl in particular due to severe weather conditions especially low temperature and snow cover formed on the floating gardens which caused stress and affected the distribution as well as movement of the birds. This observation is also supported by the investigation done by Heitmeyer and Vohs [17]; Qadri [18].

February and early March are the most suitable roost sites for birds both climatically and in food abundance, the number of birds again increased enormously. The foraging success was high and there was less competition and

therefore the bird density increased accordingly. This observation is also supported by the Shah [13]. The short emergent vegetation provided an excellent feeding and breeding habitat to the summer residents like Dabchicks, Terns, Little bitterns etc. while late autumn and in winter due to death and decomposition of vegetation a clear water pool is formed which attract large number of birds for feeding on the seeds and fruits of the decomposing plants. Change in vegetational cover has been observed and it is due to overgrazing by cattle, harvesting of macrophytes for food and fodder purpose as well as burning of residual vegetation leads to the elimination of some important plants besides reducing the cover for nesting and breeding purposes. This has reduced the density of birds particularly golden oriole, paradise fly catcher, woodpecker, Kashmiri grey tit, ring dove. The reason for this would be the extensive loss of large tracts and indiscriminate clearing of trees. Other threats include conversion of agriculture land, heavy grazing and habitat destruction by poachers. This is also observed by other workers [19]. Hence, it is high time to save this wetland for future generation.

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