INTERNATIONAL JOURNAL OF AGRICULTURE & BIOLOGY
ISSN Print: 1560–8530; ISSN Online: 1814–9596
08–112/MHB/2008/10–6–719–721
http://www.fspublishers.org

Short Communication

Importance of SCARP Evaporation Ponds as Aquatic Bird Habitat

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ABSTRACT

Aquatic birds were counted on four different ponds of the SCARP wetland in district Rahim Yar Khan Punjab, Pakistan during February and September, 2000 and 2001. With respect to the number of birds, the two counting years did not differed significantly, however, the February and September counting sessions differed statistically significantly. Different study ponds also attracted different number of aquatic birds.

Key Words: Water birds; Artificial wetland; Ducks; Waders

INTRODUCTION

A main feature of the province of Punjab of Pakistan is its extensive canal irrigation system (IWASRI, 1998). The irrigation canals were dug-out during later half of nineteenth century to bring vast tracts of tropical thorn forest under agriculture and grow more food for rapidly increasing human population in the then British India. Construction of barrages and head-works on rivers to harness water for irrigation via the canals resulted into productive farmlands and forest plantations. The system worked well for nearly a century till the percolating irrigation water raised the ground water table up to the root zone or even above the soil surface in low lying areas and natural depressions. The rising water also brought dissolved salts with it to the upper productive layer of soil rendering it unfit for cultivation of conventional crops (IWASRI, 1998). To reclaim the waterlogged and salt effected agricultural lands Salinity Control and Reclamation Projects (SCARP) were planned and implemented with the assistance of the World Bank and some other donor agencies (IWASRI, 1998). The first of the SCARPs came into operation in 1963 and since then more than 60 of them have been implemented all over the country.

Though, disposal of drainage effluents to the sea is considered environmentally safer, however on account of the geographical, technical and political constraints the disposal of the saline drainage effluents to low lying basins in arid areas at desert margins provides an alternate. The Panjnad-Abbasia Salinity Control and Reclamation Project drain its effluents in natural depressions, the relicts of the bed of the extinct river Hakra, at the margin of Cholistan desert in the districts of Rahim Yar Khan. The SCARP partially started in 1989 and became fully operational in 1991. Owing to their closeness to the Indus River, which is internationally rated as the fourth major bird migratory route in order of importance (Roberts, 1991-92), the SCARP ponds attracted a substantial number of waterbirds.

The objective of this study was to assess the importance of SCARP Evaporation Ponds as a wintering/staging habitat for migratory waterfowl migrating along the Indus Bird Flyway and the resident waterbirds.

MATERIALS AND METHODS

For the current study, the species-wise number of water birds was counted on four different ponds of the SCARP wetland, located close to latitude 28^{o} N and longitude 70^{o} E, twice annually during the Year 2000 and 2001 with the help of spotting-scope's observation field samples and counts thus obtained summed to get the number of aquatic birds on the given pond site for three consecutive days within 30 min after sunrise before sunset and averaged to obtain bird count for the counting session. Three-way Analysis of Variance of the count data was used to compare the number of aquatic birds.

RESULTS AND DISCUSSION

The comparison of water birds recorded on the four SCARP study ponds during the four counting sessions of this study is given in Table I. The number of aquatic birds visiting the area during 2000 and 2001 was not significantly different ($p > 0.05$). But the February and September counts differed significantly ($p < 0.001$). The difference in mean

Table I. Counts and proportions of aquatic birds in February and September at the four SCARP study sites during the years 2000 and 2001

Count	2000		2001		2 years combined		2 months combined		Site
	Feb	Sep	Feb	Sep	Feb	Sep	2000	2001	Total
					Site 1				
	15742	**4839**	**17055**	**10800**	**32797**	**15639**	**20581**	**27855**	**48436**
% Site total[1]	32.50	9.99	35.21	22.30	67.71	32.29	42.49	57.51	100.00
% Total count[2]	30.14	46.48	34.68	76.45	32.34	63.73	32.86	44.00	38.46
% Grand total	12.50	3.84	13.54	8.57	26.04	12.42	16.34	22.12	38.46
					Site 2				
	14545	**3386**	**11620**	**803**	**26165**	**4189**	**17931**	**12423**	**30354**
% Site total	47.92	11.16	38.28	2.65	86.20	13.80	59.07	40.93	100.00
% Total count	27.85	32.52	23.63	5.68	25.80	17.07	28.63	19.62	24.10
% Grand total	11.55	2.69	9.23	0.64	20.77	3.33	14.24	9.86	24.10
					Site 3				
	16227	**1535**	**14550**	**1269**	**30777**	**2804**	**17762**	**15819**	**33581**
% site total	48.32	4.57	43.33	3.78	91.65	8.35	52.89	47.11	100.00
% Total count	31.07	14.74	29.58	8.98	30.35	11.43	28.36	24.99	26.66
% Grand total	12.88	1.22	11.55	1.01	24.44	2.23	14.10	12.56	26.66
					Site 4				
	5712	**651**	**5960**	**1255**	**11672**	**1906**	**6363**	**7215**	**13578**
% Site total	42.07	4.79	43.89	9.24	85.96	14.04	46.86	53.14	100.00
% Total count	10.94	6.25	12.12	8.88	11.51	7.77	10.16	11.40	10.78
% Grand total	4.54	0.52	4.73	1.00	9.27	1.51	5.05	5.73	10.78
					Total count from all the sites				
Total count	**52226**	**10411**	**49185**	**14127**	**101411**	**24538**	**62637**	**63312**	**125949***
% G total	41.47	8.27	39.05	11.22	80.52	19.48	49.73	50.27	100

* Grand total

[1] $$\%\ \text{Site total} = \frac{\text{No. of birds in a given count for a given site}}{\text{Total of all the four counts at that site}} \times 100$$

[2] $$\%\text{Total count} = \frac{\text{No. of birds in a given count}}{\text{Total number of birds from the four sites during that count}} \times 100$$

Table II. Results from three-way AOVA comparing the counts of the birds on the four study sites

SOV	DF	SS	MS	F	P
Year	1	0.239	0.239	0.003	0.962
Month	1	14975.198	14975.198	165.798	0.001
Site	3	5832.422	1944.141	21.525	0.016
Residual	3	270.965	90.322		
Total	15	23388.383	1559.226		

Table III. Pair-wise multiple comparisons for the month and sites using Duncan's Method

Comparisons	Diff of Means	p	q	P<0.05
Months				
February vs. September	61.187	2	18.210	Yes
Site				
S_1 vs. S_4	53.957	4	11.355	Yes
S_1 vs. S_2	28.656	3	6.030	Yes
S_1 vs. S_3	26.684	2	5.616	Yes
S_3 vs. S_4	27.273	3	5.739	No
S_3 vs. S_2	1.971	2	0.415	No
S_2 vs. S_4	25.301	2	5.325	Yes

counts among various sites was greater than it would have been expected by chance after allowing for the effects of differences in the years and the months ($p < 0.05$) (Table II). The differences between the months and sites, as isolated by Duncan's procedure are given in Table III. As noted earlier the number of aquatic birds counted during February and September were different at a statistically significant level ($p < 0.05$); the February count being far greater than the September one. As for sites, S_1 was more species rich than S_2, S_3 and S_4 and S_2 than S_4 (Table III) ($p < 0.05$).

Along the international bird flyways the aquatic birds had shown major declines in their numbers, though the reasons yet remain to be poorly understood (International Wader Study Group, 2003). Presumably the loss and alteration of the natural wetlands in the way of flyway rout had been the main cause for those declines (Morrison *et al.*, 2001). The man-made or anthropogenic habitats are known to have great potential to modify and affect wintering and feeding sites of the aquatic birds (Sanchez-Guzman *et al.*, 2007). The previously unused and newly created water bodies can act as buffers against the habitat loss (Weber *et al.*, 1999). Therefore, it is important to identify buffer wetlands to supplement the declined natural aquatic habitat on the strategic levels to ensure conservation of waterfowl migrating at the international scale (Elphic, 2000; Masero, 2003). The SCARP habitat in Cholistan area, not very far from the mighty Indus River, qualify as a such buffer wetland and needs to be given due consideration for careful management in the long term from the waterfowl conservation point of view.

Acknowledgement. Help by the staff of Punjab Wildlife Research Institute, Gatwala, Faisalabad, Pakistan in the field surveys and partial financial support by WWF-Pakistan for the field work is gratefully acknowledged.

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(Received 25 April 2008; Accepted 14 July 2008)