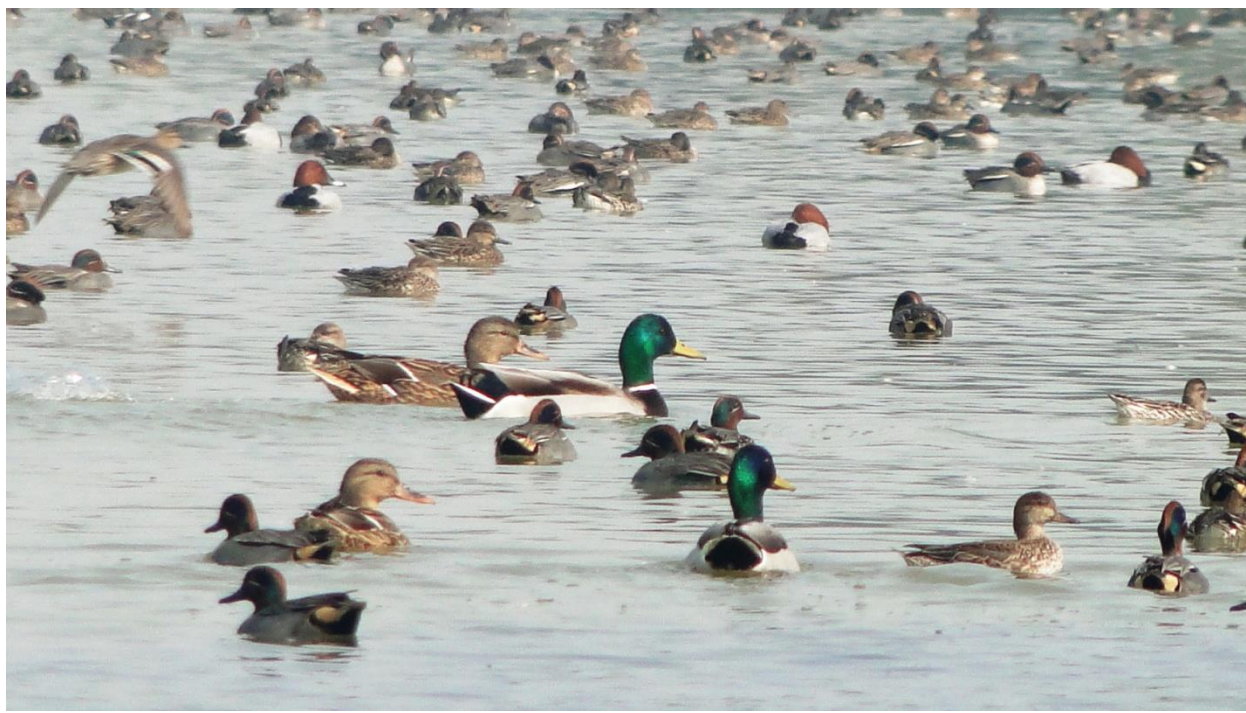




Research Report of;

Mid-winter Waterfowl Census at Important Wetlands of Sindh

January 2016



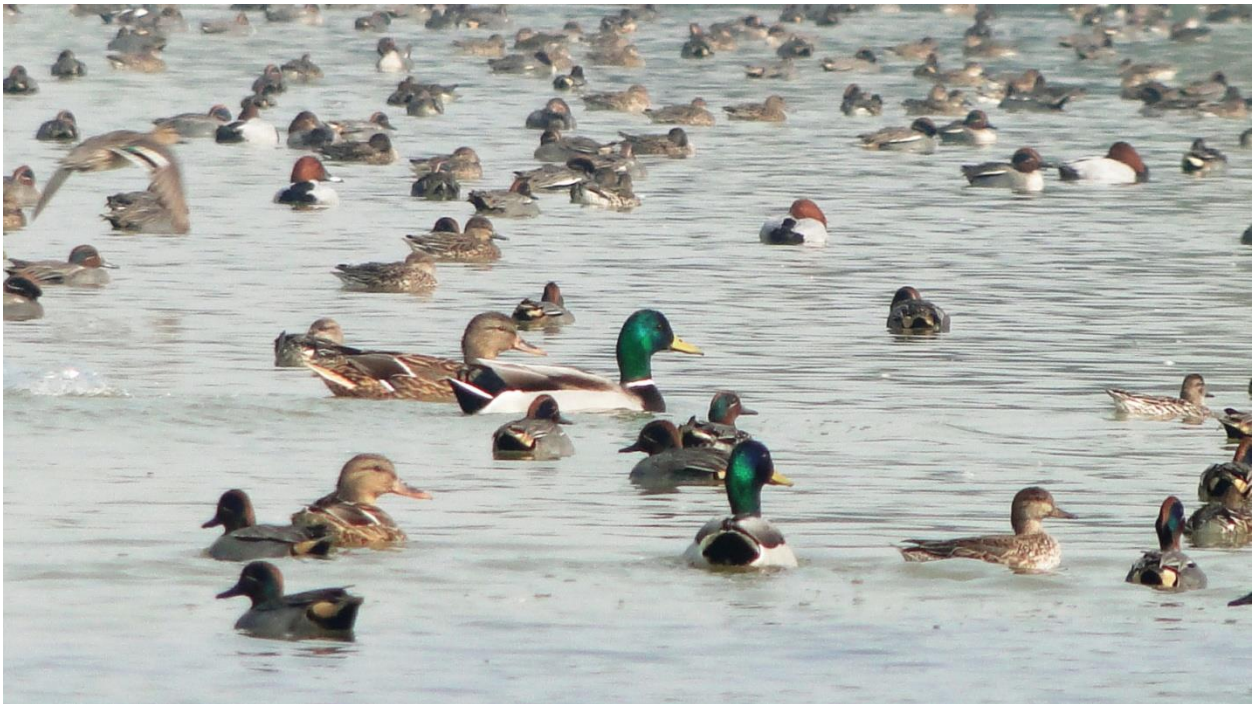
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(Flock of ducks at Lungh Lake)

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Mid-winter Waterfowl Census at Important Wetlands of Sindh

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Introduction: -

The Asian Waterfowl Census (AWC) is a coordinated international scheme for the collection and dissemination of knowledge and information on aquatic birds and wetlands. This coordinated scheme is a regular activity and has been conducted globally since 1970's and was coordinated by international waterfowl and wetlands research survey and Asian wetlands bureau, currently by Birds International, results of which are being published since 1987 and forms parts of the global International Water bird Census.

Over the last half century, the IWC has evolved in to the largest coordinated monitoring programme on earth expanding from a small number of Western Palearctic countries to cover 100 countries worldwide.

Over five million square kilometers (Kms) of wetlands have been identified as internationally important and 1 million square kilometers are designed as Ramsar sites worldwide (Asian Water bird census 2016).

The main objectives of these surveys are to monitor waterfowl population annually and also study the trends of their population at various wetlands during migratory season i.e. winter (non-breeding). In addition to monitor the status and condition of wetlands, create awareness and interest among local communities about migratory water birds and wetlands and thereby promote their conservation. The data has also helped to determine population declines in time and triggered adequate management actions both at site and at flyway level.

In Pakistan, these surveys are carried out under the auspices of and Zoological Survey of Pakistan (ZSP) since 1972. In addition to studies for Conservation of Migratory Species (CMS), these studies are also in continuation of Mid-winter waterfowl census at the wetlands of Pakistan. Thus for better management and conservation of waterfowl, it is necessary to monitor their migratory pattern, analyze population trends, status and

distribution of waterfowl species, assessing wetland values and identification of important sites for protection of threatened species.

The current study deals with the counts of waterfowl population on major wetlands of Sindh during the month of January 2016. These wetlands include Sukkure Barrage, Sufi Anwar Shah Dhand, Drigh, Lungh, Hammal, Manchar, Haleji, Kheejhar and Hudero Lakes.

DESCRIPTION OF THE SITES

Sukkur Barrage

The Sukkur Barrage (formerly called Lloyd Barrage), built under the British Raj on the Indus River, controls one of the largest irrigation system in the world. It is located in upper Sindh province with coordinates of 68° 33' E, 27° 41' N. The Barrage is situated 160 km downstream of Guddu Barrage and about 480 km up stream of Kotri Barrage. Three canals viz. Dadu canal, Rice canal and Kirthar canal emerge right bank at Sukkur Barrage while three canals arise from the left bank of the Barrage. These are Rohri, Nara and N.W canals.

The climate of Sukkur is characterized by hot hazy weather during summer days and dry cold weather in winter. During January the temperature ranges from 7 to 22°C (45 to 72°F). The summer (month of June before monsoon) temperature averages 35°C (95 °F) though it often reaches up to 42°C (108 °F). Generally the summer season commences in March-April and ends before October. The average rainfall of the district is 88mm, and ranges from 0.59mm to 25.62mm per month.

Sufi Anwar Lake

Sufi Anwar Lake is situated in Sarhad forest (68° 50' E, 24° 51' N) at a distance of 15 km from Mirpur Mathelo of Ghotki District. Sufi Anwar forest is a Government reserved forest stretching at the length of 12 hectares. The lake area of the forest is about 150 hectors.

The lake has fresh water about 1 to 3 meters in depth, the half area of the lake covered with typha and other aquatic plants which provide a best roosting and feeding ground for migratory and residential water bird species.

The general climate of the area is characterized by hot weather during summer days and dry cold weather in winter. Generally the summer season commences in March-April and ends before October. The average rainfall of the area is 88mm, and ranges from 0.59 mm to 25.62 mm per month.



(Figure 1, a flock of common green-winged teal and Shovler at Sufi Anwar Lake)

Lungh Lake

Lungh Lake (68° 21' E, 27° 56' N) is an important wetland and a globally declared Ramsar Site of Pakistan at Sindh, located in district Larkana was declared Wildlife Sanctuary in 1982.

The lake is spread over an area of 3 kilometers. Continuous efforts by Sindh Wildlife Department for habitat management and its improvement have made the lake an ideal refuge for migratory waterfowl in the wintering months.

Every year the lake receives large variety of migratory waterfowl because of its ideal location on Indus Flyway, it is considered as the best wetland in Northern Sindh.

Habitat of the lake can be divided in three types; open water with Typha and Juncus on edge, swampy area dominated by Tamarix and surrounding rice fields with predominant Juncus species.



(Figure 2, a view of Lungh Lake)

Drigh Lake

Drigh Lake in District Qambar Shadadkot of Sindh Province is a small slightly brackish lake with extensive marshes on the flood plain of Indus River, formerly an ancient arm of the Indus, but now about 30 km from the River, approximately 7 km long and about 350 feet wide.

The sanctuary was listed wetland of international importance under the Ramsar Convention in 1976. The River Indus flows 48 km in the east and limestone hill exists 75 km in the west of the lake and lies in a shallow depression. The lake is fed by monsoon

rains, several small streams entering along the western side and water from a small canal in the north. The size of the lake has decreased in recent years due to diversion of flood water for irrigation purposes and now completely overgrown with emergent vegetation, mainly Tamarix and Typha.

The climate of the area is arid subtropical with an average annual rainfall of about 175 mm, mostly during summer monsoon. The summer are hot with maximum temperatures of 49 °C in the shade, the winters are cool with minimum temperature in January 1.7 °C.

Currently a local influential person who claims that the lake is his property and there is no control of Government on the lake.

Manchar Lake

Manchar Lake is one of the largest fresh water lakes of Asian sub-continent located at distance of about 18 km from Sehwan town of district Jamshoro, Sindh (longitude. 67°-43' E and latitude 26°-23' to 26°-28' N). The lake covers an area of approximately 200 km², in district Jamshoro at one side and district Dadu on the other. During Monsoon season (July-September), water from Indus River and other seasonal streams originating from Kirthar Range i.e. NaiGaj, NaiBaran and Naiangai fall in lake spreading over an area up to 300 km². The surrounding area of the lake is classified as arid subtropical, with very hot summers and cold winters (Scoot and Poole, 1989).

Manchar lake is wintering place and / or home for thousands of water birds. Some of them live at this wetland throughout the year, while other visit the lake either in winter or in summer.

Due to high salinity of water and other polluting factors, most of the aquatic plants species i.e. *Scrupuslittoralis*, *Scripus linaneatus*., *Scripus debitis*, *Nymphea slallata*, *Typha elephant*, *Typhadomecilus*, *phargmites kakra* and *Nymphea nouchali* are on the verge of local extinction in the Lake and resulting in loss of habitat for different birds (Scott and Poole 1989). The Lake now serves only as a transit for waterfowl and other migratory water birds which used it as feeding ground in the past.

Hammal Lake

Spread over an area of 50,000 hectares the unprotected lake (27°26'54"N 67°39'10"E) is a complex of shallow freshwater lakes and marshes on the west bank of the Indus extending for almost 100 km from Kubo Said Khan to the region of Nasirabad Sindh.

Aquatic vegetation of the wetland comprises of *Cyperus alternifolius*, *Hydrilla verticillata*, *Najas minor*, *Scripus littoralis*, *Impomoea aquatic*, *Juncus articulatus*, *J. marilimus*, *Polamogelon peclinalus*, *Typha angusiata* and *Tamarix dioica*.

Arid sub-tropical climate prevails with an average annual rainfall of about 150mm. The summers are hot, with maximum temperatures of 50°C. Winters are cool, with an average minimum temperature of 10°C.

Irrigation, fishing and harvesting of weeds and bushes for local cottage industries, livestock grazing, forestry and agriculture in surrounding areas are major land use activities.

Kheenjhar Lake

Kheenjhar (24°54'56"N 68°04'15"E) is a large freshwater lake with very extensive reed – beds, particularly in the shallow western and northern parts. The lake is 24 km long by 6 km at its widest and has an irregular shoreline of about 192 km. It was created in the 1930's from two smaller lakes, Keenjhar and Kairi, by the construction of dam at Chilia Bangla and a 12 km long embankment (bund) along the east side. The lake is set in stony desert, which is composed of alternating layers of fossil – bearing limestone and sandstone. The lake is fed by the KB feeder canal, which enters at the north western corner, and by many small seasonal streams entering on the western and northern

shores, The only outlet is through the dam and the Jam branch canal at the southeast corner of the lake. The maximum depth of the lake is 8m.

Dry sub-tropical monsoonal climate with very hot summers and mild winters. The average annual rainfall is 175mm most of which falls during the summer monsoon. Temperatures range from an average minimum of 1.5°C in January to a maximum of 47°C in summer.

Extensive reed-beds of *Phargmites karka*, *Typha angustata* and *Juncus articulatus*, and a rich growth of submerged and floating aquatic vegetation including *Hydrilla verticillata*, *Potamogeton pectinatus*, *P. perfoliatus*, *Polygonum bardatum*, *Nymphaea lotus*, *Vallisneria spiralis* and *Zannichellia palustris*. *Tamarix dioica* grows along the shoreline. The natural vegetation of the region is tropical thorn forest with species such as *Acacia nilotica*, *A. Senegal*, *Commiphora mukul*, *Prosopis cineraria*, *Euphorbia caducifolia*, *Cenchrus ciliaris*, *Salvadora oleoides* and *Dicanthium annulatum*.

The lake was first protected as Game Sanctuary in 1971 under Section 15/1 of the West Pakistan Wildlife Ordinance of 1959. The site was listed as a Wetland of International Importance under the Ramsar Convention in July 1976, and declared a Wildlife sanctuary in March 1977 under Section 14 on the Sind wildlife protection ordinance.

Major activities on site include the commercial fishing, domestic water supply for Karachi City, scientific research and public recreation.

Hudero lake

Hudero Lake (24°49'N 67°52'E) is a brackish water lake, spreading at an area of 1321 hectares. The lake is situated on stony desert at the distance of 10 km north-west of Thatta City. The main source of water at the lake is seepage from Jam Branch which passes adjacent to lake. The lake has few species of water plants which includes, *Phargmites karka*, *Typha angustata* and *Juncus articulatus*.

The area has dry sub-tropical monsoonal climate with very hot summers and mild winters. The average annual rainfall is 175mm most of which falls during the summer monsoon. Temperatures range from an average minimum of 1.5°C in January to a maximum of 47°C in summer like that of Keenjhar and Haleji Lakes. Once the lake was home to thousands of water birds especially Pelicans and migratory ducks but currently a few water birds are found at the lake.

Haleji Lake

Haleji lake is an artificial and sub-tropical lake, located in Thatta, about 120-140 Km from Hyderabad and 90-120 Km from Karachi. The lake is supplied water from the Indus at Kotri barrage by K.B. Feeder via Jam Branch. The water from Kinjhar continues to be a main source of drinking water for Thatta District Noori abad Industrial area and Karachi city. The Haleji has an area of about 6.5 sq. K.M.

The lake is of ecological importance and in addition to being gazetted wildlife sanctuaries established by the Government of Sindh, and also defined under Article-2 of Ramsar Convention as wetlands of international importance for waterfowl refuge. Previously the lake was considered as water bird paradise but now only a few, both migratory and resident water birds can be observed at the lake.

MATERIALS AND METHODS

The wetlands were surveyed during the months of January for mid-winter waterfowl census 2016. Each wetland was visited at least three times during the survey period and counts were made at different selected points. The birds were directly observed, identified and counted with the help of binoculars (Olympus 8-16 X 40, DPS I) and spotting scopes (Nikon w/ 15-45 X). The GPS receiver (Magellan SporTrack) was also used to record the coordinates of each wetland. For the identification of water birds, Sonobe and Usui (1993) were referred. We paid great attention to the identification of each species of migratory water birds. Identifying as many species in

each flock as possible, and then applying the observed ratios to unidentified members of the flocks to estimate total numbers of each species. The total number of the birds was determined by direct counts by selecting plots at each site of the wetlands and counting the number of species and birds in each plot and then multiplying each plot with total area of the wetland to determine the number of birds present at the total area of wetland. The data collected and then computed to find out the total population of migratory water birds at each wetland.

Table -1 showing the details of water birds on wetlands of Sindh.

S. #	Scientific Name	Common Name	Sukkur Barrage	Sufi Anwar Dhand	Lungh Lake	Drigh Lake	Hammal Lake	Mnachar Lake	Hudero Lake	Keenjhar Lake	Haleji Lake	Total
1	<i>Tachybaptus</i>	Little Grebe	5	36	12	25	613	119	2	12	11	835
2	<i>Pelecanus. crispus</i>	Dalmatian Pelican	0	0	0	0	2	0	0	0	0	2
3	<i>Phalacrocorax carbo</i>	Large Cormorant	0	5	81	12	1120	487	0	12	6	1723
4	<i>Phalacrocorax fuscicollis</i>	Indian Shag	0	0	42	0	32	601	0	102	213	990
5	<i>Phalacrocorax niger</i>	Little Cormorant	12	25	64	27	1761	612	36	41	7	2585
6	<i>Ardeola grayii</i>	Indian Pond Heron	4	13	125	21	293	143	6	0	32	637
7	<i>Ixobrychus flavicollis</i>	Black Bittern	0	2	0	0	0	0	0	0	0	2
8	<i>Gorsachius melanolophus</i>	Malayan Night Heron	0	0	0	172	0	0	0	0	0	172
9	<i>Bubulcus ibis</i>	Cattle Egret	18	35	36	35	512	67	0	9	67	779
10	<i>Egretta garzetta</i>	Little Egret	24	45	112	16	2360	418	12	87	176	3250
11	<i>Egretta intermedia</i>	Intermediate Egret	0	22	59	0	1252	132	0	10	0	1475
12	<i>Egretta alba</i>	Large Egret	0	12	93	8	321	98	0	13	4	549
13	<i>Ardea purperia</i>	Purple Heron	0	2	0	0	6	44	0	0	0	52
14	<i>Ardea cineria</i>	Gray Heron	2	16	62	4	310	172	0	15	0	581
15	<i>Anser anser</i>	Grey lag Goose	0	0	0	0	7	0	0	0	0	7
16	<i>Tadorna tadorna</i>	Common Shelduck	0	0	0	0	0	0	0	0	2	2
17	<i>Anas penelope</i>	Eurasian Wigeon	0	0	0	0	1570	162	0	0	0	1732
18	<i>Anas streptera</i>	Gadwall	0	26	44	0	1612	89	0	0	0	1771
19	<i>Anas crecca</i>	Common Teal	12	3461	14280	0	9321	3719	360	0	417	31570
20	<i>Anas querquedula</i>	Garganey	0	0	7	0	0	0	0	0	0	7
21	<i>Anas platyrhynchos</i>	Mallard	0	7	56	0	30	16	0	0	0	109
22	<i>Anas acuta</i>	Northern Pintail	0	57	612	0	1182	267	220	0	0	2338
23	<i>Anas clypeata</i>	Shovler	0	993	1725	0	1927	382	185	0	218	5430
24	<i>Aythya ferina</i>	Common Pochard	0	0	7	0	731	127	0	0	0	865
25	<i>Marmaronetta angustirostris</i>	Marbled Teal	0	0	2	0	0	0	0	0	0	2
26	<i>Aythya nyroca</i>	White-eyed Pochard	0	0	2	0	4	0	0	0	0	6
27	<i>Aythya fuligula</i>	Tufted Duck	0	0	2	0	0	2	12	0	0	16

28	<i>Amaurornis phoenicurus</i>	White-Breasted Water Hen	0	2	4	2	5	6	0	0	0	19
29	<i>Galinula chloropus</i>	Indian Moorhen	0	31	17	15	312	87	0	19	41	522
30	<i>Porphyrio porphyrio</i>	Purple Moorhen	0	8	0	0	0	12	0	5	14	39
31	<i>Fulica atra</i>	Common Coot	0	0	11	0	12317	4187	115	1252	219	18101
32	<i>Himantopus himantopus</i>	Black-winged Stilt	15	39	39	0	482	118	62	56	52	863
33	<i>Recurvirostra avosetta</i>	Pied Avocet	0	0	0	0	342	0	0	0	0	342
34	<i>Charadrius alexandrinus</i>	Kentish Plover	3	0	2	0	12	115	4	0	4	140
35	<i>Vanellus leucurus</i>	White-Tailed Plover	0	0	0	0	14	217	0	0	8	239
36	<i>Charadrius hiaticula</i>	Ringed Plover	12	0	0	0	25	45	0	0	0	82
37	<i>Holopterus indicus</i>	Red-wattled Lapwing	5	7	12	0	23	24	11	12	5	99
38	<i>Calidris. alba</i>	Sanderling	0	0	0	0	1811	245	0	0	0	2056
39	<i>Calidris minuta</i>	Little Stint	53	0	0	0	0	160	0	0	0	213
40	<i>Philomachus pugnax</i>	Ruff		75	0	0	4923	0	0	0	0	4998
41	<i>Calidris temminckii</i>	Temminck's Stint	2	0	0	0	4	16	2	12	4	40
42	<i>Gallinago gallinago</i>	Common Snipe	0	0	0	0	3	0	0	0	0	3
43	<i>Tringa erythropus</i>	Spotted Redshank	0	0	0	0	24	112	0	0	0	136
44	<i>Tringa totanus</i>	Redshank	0	0	0	0	76	214	0	0	0	290
45	<i>Tringa nebularia</i>	C - Greenshank	5	0	14	0	6	23	0	0	0	48
46	<i>Tringa ochronus</i>	Green Sandpiper	2	0	4	0	13	0	0	0	0	19
47	<i>Actitis hypoleucos</i>	Common Sandpiper	7	2	0	2	8	14	3	12	0	48
48	<i>Larus argentatus</i>	Herring Gull	4	0	0	0	56	0	0	0	0	60
49	<i>Larus ridibundus</i>	Common Black-headed Gull	4	0	4	22	174	1423	0	65	119	1811
50	<i>Sterna aurantia</i>	Indian River Tern	6	27	25	7	116	331	0	31	6	549
51	<i>Sterna hirundo</i>	Common Tern	0	0	0	0	36	12	34	3	0	85
52	<i>Sterna albifrons</i>	Little Tern	0	2	12	0	0	21	14	2	5	56
		Total	195	4950	17567	368	45748	15039	1078	1770	1630	88345

Results and Discussion

The present waterfowl census was undertaken at the wetlands of Sindh along with team of Sindh Wildlife Department from 11th January to 29th January 2016.

. The surveys were started from wetlands of upper Sindh and in order to take comprehensive data of water birds at least 2 to 3 days were spent on each wetland. During the current waterfowl census (2016), a total of 52 species of water birds (both migratory and resident) were observed at the wetlands of Sindh. Hammal Lake had the largest population (45748) of migratory water birds, while smaller population was observed at Sukkur Barrage (195) birds. *Anas crecca* (Common Teal or Green-winged Teal) was found most abundant species with highest population at almost all the wetlands i.e.31570, birds, while, *Fulica atra* (common coot) was observed second most abundant water bird at the wetlands of Sindh i.e.18101 birds. During the current survey White-eyed Pochard (*Aythya nyroca*), Marbled Tea (*Marmaronetta angustirostris*) both of these birds are globally threatened were observed at Hammal and Lungh lake, respectively. The Garganey (*Anas querquedula*) which was once very common at the wetlands of Sindh and currently only 7 individual birds were observed at Lungh Lake, while Grey leg Goose (*Anser anser*) was observed at Hammal Lake and only 2 Common Schelducks (*Tadorna tadorna*) were observed at Haleji Lake. Haleji lake once known as water bird paradise and was home of a number of water bird species especially ducks has lost its attraction for water birds and now only 2 to 4 species of water birds visit the Lake and in small numbers. The Lungh Lake which is a wildlife Sanctuary and a globally recognized wetland (Ramsar Site) had a sufficient number of water birds especially ducks.

If we compare present results with previous years, the number of water birds has decreased. This may be due to seasonal fluctuations in the area (hot weather conditions) and non-availability of food. It has been observed that duration of winter season (winter span) has decreased and the water birds start back migration to colder regions quite earlier (pers. observations). The migratory pattern has also changed may be due to climate change.

Recommendations

- ❖ During the migratory season of water birds i.e. September to March, the Provincial Wildlife Departments may depute field staff at major wetlands to protect the migratory birds from illegal hunting and poaching
- ❖ It was observed that local trade of water birds especially duck species and Coot is very common both in towns and cities of province, therefore, it is suggested that local wildlife staff may be directed to take strict action against water bird sellers and hunters.
- ❖ Detailed monitoring of migratory birds is required, so periodic surveys other than mid-winter may also be under taken. In addition studies on resident and migratory breeding water birds may also be undertaken
- ❖ The wetlands like Manchar, Hammal, Haleji and keenjhar have badly been affected by saline, agricultural and Industrial waste water and requires immediate measures from Government for their rehabilitation
- ❖ . Uncontrolled reed harvesting at wetlands devoid water birds from their habitat, so it may be controlled
- ❖ Disturbance caused by fishing and recreational activities may be minimized during migratory season.

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