

Bird surveys at wetlands in Punjab, Pakistan, with special reference to the present status of White-headed Duck *Oxyura leucocephala*

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Numbers of White-headed Ducks in Pakistan have declined substantially since the late 1980s. We surveyed 16 localities from which the species was known historically, and recorded 33 birds at four sites in January–February 2003: Uchali (22 individuals), Jahlar (two), Nammal (two) and Rawal lake (seven). In total, 118,784 individuals of 149 species were counted at the 16 sites.

INTRODUCTION

White-headed Duck *Oxyura leucocephala* is considered globally Vulnerable (BirdLife International 2004) and it is listed on Appendix 1 of the Convention on Migratory Species. It occupies a fragmented range from Spain and Algeria in the west to Mongolia, western China and India in the east (BirdLife International 2001). The resident North African population (400–600 birds) is stable, the Spanish population (c.2,500 birds) is increasing, and the East Mediterranean and Asian population of 5,000–10,000

birds is declining (Li and Mundkur 2003, Wetlands International 2002). The global population, which was around 100,000 individuals at the start of twentieth century, has decreased to 8,000–13,000 birds in 2002 (BirdLife International 2001, Li and Mundkur 2003). The global population declines in the first half of the twentieth century have been attributed mainly to habitat loss and over-hunting (Green and Hughes 1996). The main threats to the Asian population are habitat loss owing to unsustainable use of water resources and recent droughts, exacerbated by hunting and disturbance (BirdLife International 2001, Li and

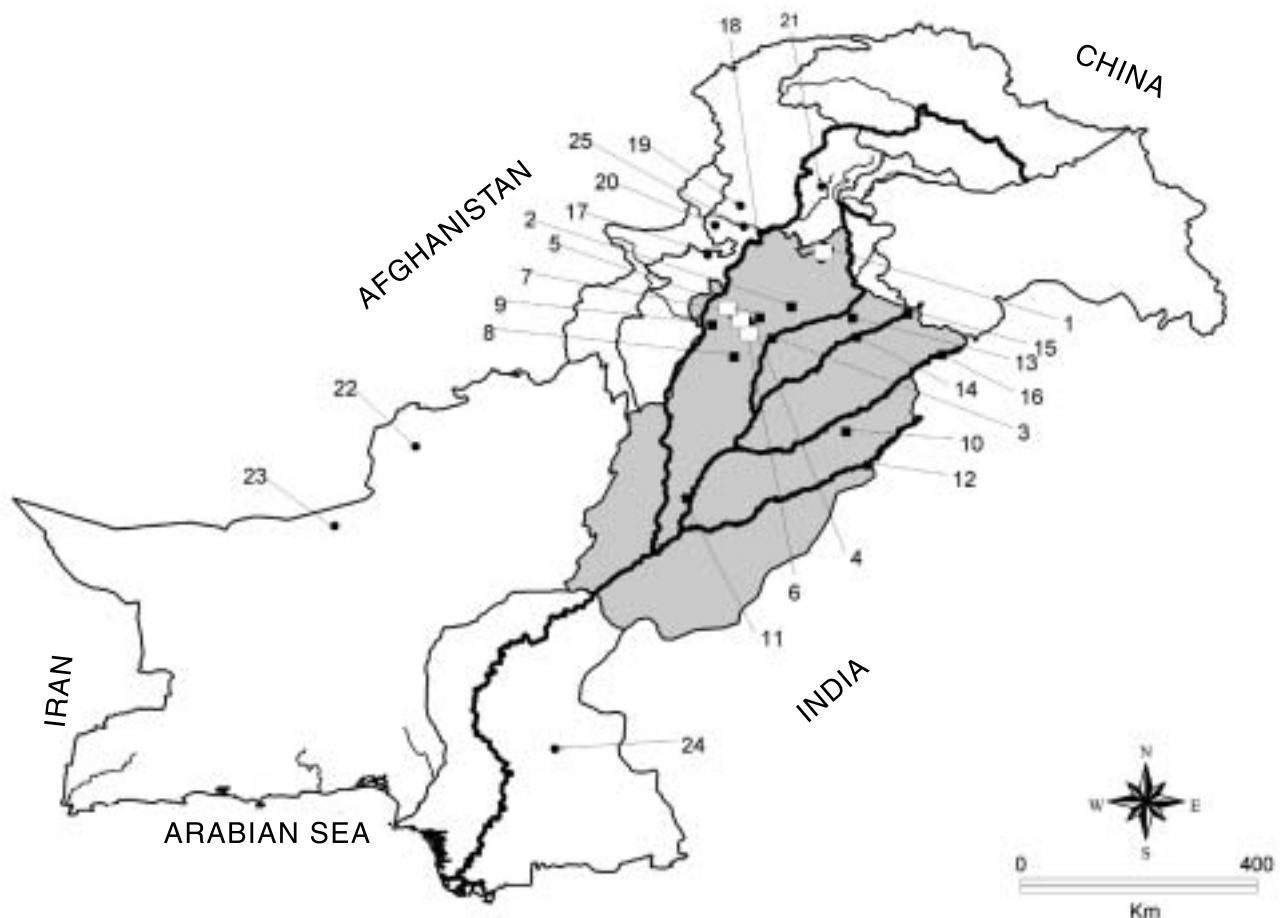


Figure 1. Historic distribution (1883–2002) of White-headed Duck *Oxyura leucocephala* in Pakistan. Squares indicate sites surveyed in 2003. Open squares indicate sites where White-headed Duck was found. Shading indicates the state of Punjab. Site names: 1. Rawal lake; 2. Kailar Kahar lake; 3. Shahpur (Jhelum bridge); 4. Jahlar lake; 5. Khabbaki lake; 6. Uchali lake; 7. Nammal lake; 8. Rangpur lake; 9. Mianwali (Chashma barrage); 10. Kharar lake; 11. Khangarh lake; 12. Bhawalnagar (Suleimanki headworks); 13. Chalianwala (Mandi Bahauddin); 14. Hafizabad (Qadarabad headworks); 15. Sialkot (Marala headworks); 16. Jassar (River Ravi); 17. Idal Khei Dhand (Kohat); 18. Akora (Kabul river); 19. Mardan; 20. Peshawar; 21. Halkot; 22. Bund Khush Dil Khan (Pishin); 23. Zangi Nawar (Chagai); 24. Sunari lake (Shangar); 25. Nowshera (NWFP)

Table 1. Waterbirds recorded at 16 sites in Punjab, Pakistan.

Site	Observation points			White-headed Duck			Reduction in area 1990-2003	Other waterbirds	
	Coordinates	Altitude (m)	Date of survey (2003)	No.	Previous max. no. (year)	Area (ha)		No. species recorded	No. individuals recorded
Rawal lake	33°41'E 73°07'N	530	28 Jan	7	6 (1987)	1902	30%	62	3,089
Kallar Kahar lake	32°46'E 72°42'N	641	28 Jan	0	90 (1972)	220	30%	91	1,246
Shahpur (Jehlum bridge)	32°18'E 72°24'N	175	29 Jan	0	5 (1930)	1350	60%	93	1,248
Jahlar lake	32°30'E 72°54'N	824	29 Jan	2	148 (1994)	100	40%	53	370
Khabbaki lake	32°37'E 72°13'N	745	29 Jan	0	1,005 (1968)	283	100%	130	342
Ucchali lake	32°33'E 72°25'N	760	29 Jan	22	667 (1987)	943	60%	103	1,591
Nammal lake	32°41'E 71°48'N	340	29 Jan	2	400 (1970)	486	50%	115	1,726
Rangpur lake	32°10'E 71°50'N	180	30 Jan	0	2 (1993)	1,250	0%	110	9,256
Chashma barrage (Mianwali)	32°31'E 71°29'N	200	30 Jan	0	1 (1922)	33,109	0%	126	71,008
Kharar lake	30°53'E 73°32'N	165	05 Feb	0	700 (1975)	235	100%	23	382
Khengarh lake	29°52'E 71°67'N	100	06 Feb	0	1 (1883)	100	80%	35	257
Sulmanki headworks (Bahawalnagar)	30°22'E 73°52'N	177	7 Feb	0	6 (1922)	1150	70%	85	5,821
Chalianwala	32°37'E 73°38'N	235	19 Feb	0	11 (1931)	23	95%	30	90
Qadirabad headworks (Hafizabad)	32°19'E 73°41'N	211	20 Feb	0	1 (1911)	2,850	20%	101	9,711
Marala headworks (Sialkot)	32°40'E 74°28'N	242	20 Feb	0	1 (1891)	1650	10%	92	8,059
Jassar (River Ravi)	32°31'E 74°59'N	334	21 Feb	0	70 (1987)	1125	70%	91	4,588
Total				33	1,039 (1968)	46,746	51%	149	118,784

Mundkur 2003). These impacts are likely to be exacerbated by the effects of global climate change.

In Pakistan, 889 were counted in 1987–1988, but numbers have declined substantially since then, and fewer than 50 have been recorded since 1995–1996 (Chaudhry *et al.* 1997). Since the late 1980s, White-headed Duck have been known to winter in Pakistan only at Ucchali, Khabbaki and Jahlar (known collectively as Ucchali wetlands complex, a Ramsar site since 1996). It is not clear, however, whether the lack of sightings elsewhere is because the birds are absent or because of inadequate surveys.

The goal of this survey, therefore, was to look for this species and assess its status at the 16 sites in Punjab where it had been recorded since the 1880s: Rawal lake, Kallar Kahar lake, Shahpur (Jehlum bridge), Jahlar lake, Khabbaki lake, Uchali lake, Nammal lake, Rangpur lake, Mianwali (Chashma barrage), Kharar lake, Khengarh lake, Bahawalnagar (Sulmanki headworks), Chalianwala, Hafizabad (Qadirabad headworks), Sialkot (Marala headworks) and Jassar (River Ravi) (Fig. 1; Appendix 1).

METHODS

Observations were made, usually for a full day, at each of the 16 sites, between 28 January and 21 February 2003. Up to five points per site were selected from which the whole site could be observed. At each point, birds were counted using a telescope before moving to the next point as rapidly as possible without disturbing the birds. Birds were identified using Grimmett *et al.* (2001). The surface area of water at each site was calculated from a map plotted using coordinates

recorded with a Magellan GPS; then the % reduction since 1990 (IUCN 1990) was calculated.

RESULTS

In total, 118,784 individuals of 149 species were counted at the 16 sites (Table 1; Appendix 2). Chashma lake, Qadirabad headworks, Rangpur lake, Marala headworks, Sulmanki headworks, Jassar (Ravi river) and Rawal lake had the highest numbers of individuals. A total of 33 White-headed Ducks were counted at four sites: Ucchali (22 individuals), Jahlar (two), Nammal (two) and Rawal lake (seven).

The highest numbers of species were at Chashma (126 species), Nammal (115), Rangpur (110), and Ucchali (103) lakes. The ten most abundant species were: Eurasian Coot *Fulica atra*, Common Pochard *Aythya ferina*, Northern Pintail *Anas acuta*, Gadwall *Anas strepera*, Little Grebe *Tachybaptus ruficollis*, Mallard *Anas platyrhynchos*, Northern Shoveler *Anas clypeata*, Water Rail *Rallus aquaticus*, Black-winged Stilt *Himantopus himantopus* and Red-wattled Lapwing *Vanellus indicus*.

White-headed Ducks were recorded only at Ucchali, Jahlar, Nammal and Rawal lakes, and were absent from all other sites from which the species was known historically. Many sites had significantly reduced water surface areas compared to data presented in IUCN (1990), with an overall reduction at all sites combined of 51%. Khabbaki, Kharrar, Chalianwala and Khengarh had all suffered 80–100% reductions in area since the 1990 figures. The likely causes of these shrinkages include ground water extraction, development of barrages and canal systems.

RECOMMENDATIONS

There is an urgent need to ensure the maintenance and improvement of the habitat conditions for White-headed Duck at the sites where the species was recorded. This will require the government, nature conservation institutions and other agencies to work together collaboratively to conserve the remaining populations. Specifically: (1) a task-force from government and non-government sectors should be constituted to study the population dynamics of migratory waterbirds in these areas; (2) detailed hydrological observations of water inflow and outflow, retention capacity, loss through evapotranspiration, manipulation of water level, silt load and its impact on vegetation etc. should be recorded; (3) pollution levels should regularly be monitored with a special emphasis on phosphorus and nitrogen cycling, one of the principal factors responsible for degradation of water quality in wetlands; (4) water levels should be managed to benefit waterbirds; and (5) some sites should be considered as closed areas for waterbirds, with disturbance by local people and cattle prohibited.

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APPENDIX 1

Records of White-headed Duck in Pakistan

Year	Locality	Province	Source	No. White-headed Duck
1883	Khengarh lake, Muzafargarh	Punjab	Baker (1908)	1
1887	Khengarh lake, Muzafargarh	Punjab	Boomford (1887)	+
1891	Halkot	NWFP	Baker (1908)	+
	Sialkot (Marala headworks)	Punjab	Sheerwood (1897)	1
1893	Peshawar	NWFP	BMNH	1
1899	Mardan	NWFP	Macnab (1902)	1
1901	Mardan	NWFP	Barton (1902)	1
1903	Khushdil Khan lake, Pishin	Baluchistan	Marshall (1903)	6
1906	Dand Idal Khel jheel, Kohat	NWFP	Whitehead (1909)	1
1907	Dand Idal Khel jheel, Kohat	NWFP	Whitehead (1911)	1
1908	Nowshera	NWFP	BNHS	1
	Akora Kabil river	NWFP	Tenison (1909)	2
1910	Khengarh lake, Muzafargarh	Punjab	BNHS	+
1911	Dand Idal Khel jheel, Kohat	NWFP	BNHS	1
	Hafizabad (Qadradabad headworks)	Punjab	BNHS	1
1914	Khushdil Khan lake, Pishin	Baluchistan	BMNH	1
1915	Zangi Nawar lake, Chagai	Baluchistan	BNHS	+
1916	Dand Idal Khel jheel, Kohat	NWFP	Bailey (1916)	4
	Zangi Nawar lake, Chagai	Baluchistan	BNHS	2
1919	Khushdil Khan lake, Pishin	Baluchistan	Jourdain (1921)	+
1921	Kharrar lake	Punjab	Wright and Dewar (1925)	40
1922	Nammal lake	Punjab	Waite (1922)	3
	Bahawalnagar (Sulmanki headworks)	Punjab	Bolster (1923)	6
	Mianwali (Chashma barrage)	Punjab	Wright and Dewar (1925)	+
	Mianwali (Chashma barrage)	Punjab	Flemming (1930)	1
	Mianwali (Chashma barrage)	Punjab	Bolster (1923)	+
1928	Nowshera	NWFP	Whitehead (1931)	1
1930	Nowshera	NWFP	BNHS	1
	Shahpur (Jehlum bridge)	Punjab	Flemming (1930)	5
1931	Peshawar	NWFP	Sturm (1932)	1
	Chalianwala Mandi Bahawaldin	Punjab	Whitehead (1931)	11
1938	Zangi Nawar lake, Chagai	Baluchistan	Christison (1942)	+
1939	Zangi Nawar lake, Chagai	Baluchistan	Christison (1942)	+
	Kallar Kahar lake	Punjab	Waite (1948)	+
1940	Nowshera	NWFP	Field (1942)	1
	Zangi Nawar lake, Chagai	Baluchistan	Christison (1942)	12
1948	Kallar Kahar lake	Punjab	Waite (1948)	+
	Khabbaki lake	Punjab	Waite (1948)	+
1960	Kallar Kahar lake	Punjab	Scott (1989)	+
1965	Khabbaki lake	Punjab	BMNH	+
	Khabbaki lake	Punjab	Savage (1965a,b)	723
1967	Khabbaki lake	Punjab	BNHS	+
	Khabbaki lake	Punjab	PFIP	218
	Kallar Kahar lake	Punjab	PFIP	90
	Khabbaki lake	Punjab	Mountfort and Poore (1968)	500
1968	Khabbaki lake	Punjab	Green and Anstey (1992)	1005
	Nammal lake	Punjab	PFIP	25
	Kallar Kahar lake	Punjab	PFIP	9
1969	Uchalli lake	Punjab	Green and Anstey (1992)	100
1970	Uchalli lake	Punjab	PFIP	1
	Khabbaki lake	Punjab	PFIP	1
	Nammal lake	Punjab	PFIP	4
	Nammal lake	Punjab	Scott (1989)	400
1971	Khabbaki lake	Punjab	PFIP	161
	Nammal lake	Punjab	PFIP	39
1972	Suneri lake	Sindh	Roberts (1991)	1
	Khabbaki lake	Punjab	Koning and Walmsley (1972)	295
	Nammal lake	Punjab	PFIP	127
	Uchalli lake	Punjab	PFIP	102
	Khabbaki lake	Punjab	PFIP	85
	Khabbaki lake	Punjab	Roberts (1991)	+
	Nammal lake	Punjab	Koning and Walmsley (1972)	127

Year	Locality	Province	Source	No. White-headed Duck
	Uchalli lake	Punjab	Koning and Walmsley (1972)	102
	Kallar Kahar lake	Punjab	Roberts (1991)	90
1973	Kharrar lake	Punjab	Roberts (1991)	188
	Khabbaki lake	Punjab	PFIP	388
	Nammal lake	Punjab	PFIP	111
1975	Kharrar lake	Punjab	Roberts (1991)	700
	Uchalli lake	Punjab	PFIP	470
1983	Khabbaki lake	Punjab	PFIP	734
1984	Khabbaki lake	Punjab	PFIP	209
	Kallar Kahar lake	Punjab	PFIP	46
1985	Khabbaki lake	Punjab	PFIP	120
1986	Khabbaki lake	Punjab	PFIP	325
1987	Rawal lake	Fedral Area	Mallalieu (1988)	6
	Jahlar lake	Punjab	Scott (1989)	68
	Uchalli lake	Punjab	Roberts (1991)	467
	Kharrar lake	Punjab	Scott (1989)	48
	Jassar (River Ravi)	Punjab	Roberts (1991)	70
	Jahlar lake	Punjab	PWRI	65
	Kharrar lake	Punjab	PWRI	48
	Uchalli lake	Punjab	Scott (1989)	667
	Uchalli lake	Punjab	PWRI	65
1988	Jahlar lake	Punjab	Scott (1989)	132
	Uchalli lake	Punjab	PWRI	154
	Jahlar lake	Punjab	PWRI	132
1989	Jahlar lake	Punjab	PWRI	56
	Uchalli lake	Punjab	PWRI	100
	Kharrar lake	Punjab	PWRI	31
1990	Jahlar lake	Punjab	Scott (1989)	6
	Jahlar lake	Punjab	PWRI	44
	Kharrar lake	Punjab	PWRI	14
	Jahlar lake	Punjab	Chaudhry (1992)	105
1991	Khabbaki lake	Punjab	Green and Anstey (1992)	142
	Uchalli lake	Punjab	PWRI	2
	Jahlar lake	Punjab	PWRI	30
	Khabbaki lake	Punjab	PWRI	32
1992	Jahlar lake	Punjab	PWRI, Zulfiqar Ali	145
	Khabbaki lake	Punjab	PWRI, Zulfiqar Ali	144
1993	Jahlar lake	Punjab	PWRI, Zulfiqar Ali	148
	Khabbaki lake	Punjab	PWRI, Zulfiqar Ali	43
1994	Jahlar lake	Punjab	PWRI, Zulfiqar Ali	144
1995	Khabbaki lake	Punjab	PWRI, Zulfiqar Ali	14
	Jahlar lake	Punjab	PWRI, Zulfiqar Ali	37
1996	Jahlar lake	Punjab	PWRI, Zulfiqar Ali	32
1997	Khabbaki lake	Punjab	PWRI, Zulfiqar Ali	36
	Jahlar lake	Punjab	PWRI, Zulfiqar Ali	16
1998	Khabbaki lake	Punjab	Zulfiqar Ali	9
	Jahlar lake	Punjab	Zulfiqar Ali	47
	Uchalli lake	Punjab	Zulfiqar Ali	1
1999	Khabbaki lake	Punjab	Zulfiqar Ali	9
	Jahlar lake	Punjab	Zulfiqar Ali	27
2000	Khabbaki lake	Punjab	Zulfiqar Ali	7
	Jahlar lake	Punjab	Zulfiqar Ali	16
2001	Khabbaki lake	Punjab	Zulfiqar Ali	5
	Jahlar lake	Punjab	Zulfiqar Ali	10
2002	Jahlar lake	Punjab	Zulfiqar Ali	10
2003	Jahlar lake	Punjab	Zulfiqar Ali	2
	Uchalli lake	Punjab	Zulfiqar Ali	22
	Rawal lake	Fedral Area	Zulfiqar Ali	7
	Nammal lake	Punjab	Zulfiqar Ali	2

Key

+ = Present, exact number not known

BMNH= Bombay Museum of Natural History; BNHS= Bombay Natural History Society; PFIP= Pakistan Forest Institute, Peshawar; PWRI= Punjab Wildlife Research Institute.

APPENDIX 2

Birds recorded at 16 wetland sites in Punjab, Pakistan, 28 January to 21 February 2003

Species	Rawal lake	Khabbaki lake	Kallar Kahar lake	Uchhalli lake	Jahlar lake	Nammal lake	Shahpur (Jehlum bridge)	Rangpur marsh area	Mianwali (Chasma barrage)	Hafizabad (Qadriabad headworks)	Chailanwala marsh area	Sialkot (head marala)	Jassar (River Ravi)	Khangarh marsh area	Bahawalnagar (Sulmanki headworks)	Kharar lake	TOTAL
GREY FRANCOLIN <i>Francolinus pondicerianus</i>	0	0	5	2	7	15	0	0	0	0	0	0	0	0	0	0	29
GREYLAG GOOSE <i>Anser anser</i>	0	0	0	0	0	0	0	0	37	0	0	0	0	0	0	0	37
RUDDY SHELDUCK <i>Tadorna ferruginea</i>	14	4	0	2	0	6	0	25	350	0	0	0	0	0	2	0	403
COMMON SHELDUCK <i>Tadorna tadorna</i>	0	5	0	0	0	12	0	5	600	11	0	12	2	0	12	0	659
WHITE-HEADED DUCK <i>Oxyura leucocephala</i>	7	0	0	22	2	2	0	0	0	0	0	0	0	0	0	0	33
GADWALL <i>Anas strepera</i>	185	9	0	26	6	18	6	650	3,500	560	0	440	250	0	355	0	6,005
EURASIAN WIGEON <i>Anas penelope</i>	26	9	0	6	0	15	0	25	450	45	0	120	25	0	25	0	746
MALLARD <i>Anas platyrhynchos</i>	65	12	0	18	2	6	3	540	4,000	200	0	425	35	0	45	0	5,351
SPOT-BILLED DUCK <i>Anas poecilorhyncha</i>	0	0	0	0	0	0	0	0	0	2	0	9	5	0	15	0	31
COMMON TEAL <i>Anas crecca</i>	15	2	0	9	0	0	2	220	200	260	0	350	350	0	460	0	1,868
GARGANEY <i>Anas querquedula</i>	0	0	0	2	0	2	0	25	25	50	0	35	12	0	85	0	236
NORTHERN PINTAIL <i>Anas acuta</i>	80	18	0	17	15	15	0	630	7,000	550	0	325	85	0	25	0	8,760
NORTHERN SHOVELER <i>Anas clypeata</i>	250	45	0	26	6	80	6	550	3,700	120	0	160	68	0	50	0	5,061
RED-CRESTED POCHARD <i>Netta rufina</i>	0	0	0	2	0	2	0	56	850	12	0	9	6	0	6	0	943
COMMON POCHARD <i>Aythya ferina</i>	500	55	0	85	16	105	12	980	11,000	1,200	0	950	600	2	205	0	15,710
FERRUGINOUS POCHARD <i>Aythya nyroca</i>	65	4	0	26	2	16	2	560	1,200	42	0	12	50	0	6	0	1,985
TUFTED DUCK <i>Aythya fuligula</i>	6	0	0	20	2	0	2	250	85	16	0	23	36	0	19	0	459
COMMON MERGANSER <i>Mergus merganser</i>	0	1	0	0	0	0	0	0	45	2	0	6	0	0	3	0	57
BLACK-RUMPED FLAMEBACK <i>Dinopium benghalense</i>	0	1	0	1	0	2	1	1	3	1	0	0	0	0	0	0	10
COMMON HOOPOE <i>Upupa epops</i>	45	15	12	27	6	12	19	14	120	25	1	24	36	1	6	12	375
INDIAN ROLLER <i>Coracias benghalensis</i>	14	9	2	6	2	26	12	16	226	58	2	14	26	4	45	2	464
COMMON KINGFISHER <i>Alcedo atthis</i>	2	1	0	1	0	6	1	12	25	1	0	2	6	0	6	0	63
WHITE-THROATED KINGFISHER <i>Halcyon smyrnensis</i>	6	3	0	2	1	5	2	14	36	12	2	14	3	1	12	1	114
CRESTED KINGFISHER <i>Ceryle lugubris</i>	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
PIED KINGFISHER <i>Ceryle rudis</i>	18	1	0	0	0	1	1	3	49	15	0	3	6	1	1	1	100
GREEN BEE-EATER <i>Merops orientalis</i>	4	9	2	6	2	9	15	25	225	45	2	16	19	2	13	0	394
BLUE-CHEEKED BEE-EATER <i>Merops persicus</i>	0	0	0	1	0	2	2	1	45	0	0	0	3	0	0	0	54
ASIAN KOEL <i>Eudynamis scolopacea</i>	1	0	0	1	1	2	0	1	2	0	0	0	0	0	0	0	8
GREATER COUCAL <i>Centropus sinensis</i>	0	3	0	1	0	1	0	1	3	0	0	0	2	0	2	0	13
HOUSE SWIFT <i>Apus affinis</i>	15	9	0	0	0	0	0	0	12	26	0	14	0	0	0	0	76
ROSE-RINGED PARAKEET <i>Psittacula krameri</i>	17	3	2	6	17	9	2	19	29	14	2	54	12	2	15	0	203
LAUGHING DOVE <i>Streptopelia senegalensis</i>	2	9	2	1	7	2	2	12	0	0	0	0	2	0	0	0	39
SPOTTED OWLET <i>Athene brama</i>	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
SYKES'S NIGHTJAR <i>Caprimulgus maharattensis</i>	0	0	0	2	6	2	0	2	0	0	0	0	0	0	0	0	12
ROCK PIGEON <i>Columba livia</i>	2	5	0	6	2	12	12	14	29	25	2	12	55	0	450	0	626
EURASIAN COLLARED DOVE <i>Streptopelia decaocto</i>	35	56	30	25	2	4	19	14	255	15	3	36	17	2	26	23	562
COMMON CRANE <i>Grus grus</i>	0	0	0	0	0	0	2	0	45	0	0	0	0	0	0	0	47
WATER RAIL <i>Rallus aquaticus</i>	19	6	0	0	0	2	2	45	2,600	0	1	0	0	0	0	0	2,675
WHITE-BREASTED WATERHEN <i>Amaurornis phoenicurus</i>	0	0	0	0	0	0	12	57	250	250	2	150	240	0	250	0	1211
COMMON MOORHEN <i>Gallinula chloropus</i>	0	1	0	0	0	6	6	75	450	120	0	12	25	2	160	0	857
COMMON COOT <i>Fulica atra</i>	450	125	0	150	19	210	19	900	19,000	2,000	0	2,500	600	0	150	0	26,123
COMMON SNIPE <i>Gallinago gallinago</i>	0	2	0	3	0	5	0	14	45	4	0	5	6	0	0	0	84
COMMON REDSHANK <i>Tringa totanus</i>	0	0	0	3	0	2	0	15	14	12	0	2	5	0	0	0	53
COMMON GREENSHANK <i>Tringa nebularia</i>	0	0	0	4	2	4	6	21	26	2	0	9	12	0	0	0	86
GREEN SANDPIPER <i>Tringa ochropus</i>	0	6	0	6	2	6	2	45	54	25	0	2	3	0	12	0	163
WOOD SANDPIPER <i>Tringa glareola</i>	0	1	0	1	1	4	2	14	23	2	0	0	1	0	0	0	49
LITTLE STINT <i>Calidris minuta</i>	0	1	0	2	1	9	2	21	12	4	0	5	6	0	13	0	76
TEMMINCK'S STINT <i>Calidris temminckii</i>	0	1	0	2	0	5	0	2	23	2	0	3	1	0	2	0	41
DUNLIN <i>Calidris alpina</i>	0	0	0	0	0	4	0	4	14	5	0	1	2	0	0	0	30
RUFF <i>Philomachus pugnax</i>	0	0	0	0	0	1	0	1	12	4	0	2	0	0	0	0	20
GREATER PAINTED-SNIPE <i>Rostratula benghalensis</i>	0	0	0	2	0	1	0	12	25	2	0	1	2	0	12	0	57

Species	Rawal lake	Khabbaki lake	Kallar Kahar lake	Uchhalli lake	Jahlar lake	Nammal lake	Shahpur (Jehlum bridge)	Rangpur marsh area	Mianwali (Chasma barrage)	Hafizabad (Qadriabad headworks)	Chailanwala marsh area	Stalkot (head marala)	Jassar (River Ravi)	Khangarh marsh area	Bahawalnagar (Sulmanki headworks)	Kharar lake	TOTAL
BLACK STORK <i>Ciconia nigra</i>	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	7
BAY-BACKED SHRIKE <i>Lanius vittatus</i>	0	1	0	2	0	2	2	1	0	0	0	0	0	0	0	0	8
LONG-TAILED SHRIKE <i>Lanius schach</i>	0	2	0	2	1	1	1	1	1	2	0	0	0	0	0	0	11
SOUTHERN GREY SHRIKE <i>Lanius meridionalis</i>	0	4	0	2	0	0	3	0	0	2	0	0	0	0	0	0	11
RUFIOUS TREEPIE <i>Dendrocitta vagabunda</i>	2	2	6	1	0	1	0	0	0	5	0	0	2	0	0	0	19
HOUSE CROW <i>Corvus splendens</i>	425	150	15	255	25	145	45	450	145	250	5	14	125	17	360	25	2,451
COMMON RAVEN <i>Corvus corax</i>	1	1	2	2	0	2	0	0	0	0	0	0	0	0	0	0	8
BLACK DRONGO <i>Dicrurus macrocercus</i>	12	5	12	10	13	2	8	12	12	12	1	12	6	2	11	0	130
COMMON WOODSHRIKE <i>Tephrodornis pondicerianus</i>	0	2	0	1	0	2	2	2	3	0	0	0	0	0	0	0	12
INDIAN ROBIN <i>Saxicoloides fulicata</i>	0	1	0	2	0	1	2	1	2	2	0	3	0	0	0	0	14
BLUETHROAT <i>Luscinia svecica</i>	0	1	0	0	0	2	4	2	24	0	0	0	0	0	0	0	33
BLACK REDSTART <i>Phoenicurus ochruros</i>	0	6	15	5	2	6	9	54	16	25	0	14	23	0	2	0	177
COMMON STONECHAT <i>Saxicola torquata</i>	0	2	0	2	1	2	5	12	100	2	0	3	5	2	6	0	142
PIED BUSHCHAT <i>Saxicola caprata</i>	2	8	6	12	15	45	6	12	25	12	0	9	14	2	15	0	183
VARIABLE WHEATEAR <i>Oenanthe picata</i>	0	1	0	1	0	1	5	0	15	5	0	0	3	0	0	0	31
DESERT WHEATEAR <i>Oenanthe deserti</i>	0	0	0	1	1	2	4	25	24	0	0	0	0	0	0	0	57
COMMON STARLING <i>Sturnus vulgaris</i>	0	0	0	0	0	0	45	450	480	25	2	14	56	2	6	8	1,088
COMMON MYNA <i>Acridotheres tristis</i>	75	56	45	45	26	16	26	250	1,200	145	1	260	250	6	35	2	2,438
BANK MYNA <i>Acridotheres gingianus</i>	2	20	21	56	5	5	45	150	140	120	1	250	214	2	23	0	1,054
PLAIN MARTIN <i>Riparia paludicola</i>	0	45	0	25	6	45	14	25	245	147	6	15	65	25	51	0	714
BARN SWALLOW <i>Hirundo rustica</i>	0	150	0	45	2	25	45	47	500	45	2	36	2	10	150	12	1,071
RED-VENTED BULBUL <i>Pycnonotus cafer</i>	5	2	6	9	2	19	18	59	26	14	2	21	23	12	6	0	224
RUFIOUS-FRONTED PRINIA <i>Prinia buchanani</i>	0	1	0	0	0	1	0	0	4	0	0	0	0	0	0	0	6
GRACEFUL PRINIA <i>Prinia gracilis</i>	0	0	0	1	0	1	1	1	2	0	0	0	0	0	1	0	7
PLAIN PRINIA <i>Prinia inornata</i>	0	0	0	2	0	1	0	0	6	0	0	0	0	1	1	1	12
BLYTH'S REED WARBLER <i>Acrocephalus dumetorum</i>	0	3	0	2	0	12	25	12	45	26	2	25	54	0	85	0	291
LESSER WHITETHROAT <i>Sylvia curruca</i>	0	0	0	1	0	2	0	1	0	0	0	0	0	0	0	0	4
COMMON TAILORBIRD <i>Orthotomus sutorius</i>	0	0	0	0	0	1	9	2	15	0	2	3	6	0	0	0	38
EURASIAN CHIFFCHAFF <i>Phylloscopus collybita</i>	0	0	0	2	0	2	0	1	2	2	0	3	4	0	0	0	16
YELLOW-EYED BABBLER <i>Chrysomma sinense</i>	0	6	0	1	0	6	9	0	0	0	0	1	0	0	0	0	23
COMMON BABBLER <i>Turdoides caudatus</i>	0	2	15	6	0	1	6	2	6	25	3	12	18	0	12	0	108
STRIATED BABBLER <i>Turdoides earlei</i>	0	0	0	1	0	1	8	0	4	0	0	0	0	0	0	0	14
JUNGLE BABBLER <i>Turdoides striatus</i>	0	0	0	1	6	12	5	2	58	6	0	8	4	0	12	0	114
CRESTED LARK <i>Galerida cristata</i>	150	35	37	25	21	15	45	45	450	84	2	15	12	15	25	12	988
ORIENTAL SKYLARK <i>Alauda gulgula</i>	0	2	0	1	0	2	4	2	26	1	0	0	2	2	2	2	46
PURPLE SUNBIRD <i>Nectarinia asiatica</i>	0	0	0	0	0	0	5	2	9	2	0	1	0	0	2	0	21
HOUSE SPARROW <i>Passer domesticus</i>	45	15	44	105	43	150	225	560	1,100	425	2	256	450	43	260	12	3,735
SIND SPARROW <i>Passer pyrrhonotus</i>	0	0	0	2	0	2	4	2	26	2	0	12	0	0	0	0	50
WHITE WAGTAIL <i>Motacilla alba</i>	4	1	3	6	3	12	2	25	12	1	0	2	3	0	45	1	120
YELLOW WAGTAIL <i>Motacilla flava</i>	6	2	2	2	0	4	12	15	45	1	2	13	2	0	4	0	110
CITRINE WAGTAIL <i>Motacilla citreola</i>	0	0	0	0	0	0	0	14	26	12	0	0	12	0	0	0	64
GREY WAGTAIL <i>Motacilla cinerea</i>	9	6	9	6	0	12	19	23	35	8	0	9	23	2	14	2	177
TAWNY PIPIT <i>Anthus campestris</i>	0	2	0	1	0	2	5	2	12	14	0	25	12	0	2	0	77
WATER PIPIT <i>Anthus spinoletta</i>	0	1	0	0	1	4	5	14	14	24	0	24	3	2	6	0	98
STREAKED WEAVER <i>Ploceus manyar</i>	0	0	0	2	0	2	2	2	0	0	0	0	0	0	0	0	8
BAYA WEAVER <i>Ploceus philippinus</i>	0	2	17	15	0	25	29	45	25	12	0	14	25	0	12	0	221
Total no. individuals	3,089	1,246	342	1591	370	1,726	1,248	9,256	71,008	9711	90	8,059	4,588	257	5,821	382	11,8784
Total no. species	62	91	30	103	53	115	93	110	126	101	30	92	91	35	85	23	149