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Birds of Jagdishpur Reservoir, Nepal

HEM SAGAR BARAL

Jagdishpur Reservoir is the largest reservoir in Nepal (at 2.25 km^2) and is considered to be among the most important wetland sites in the country (Bhandari 1998, HMGN/MFSC 2002). In 2003, Jagdishpur was designated a Ramsar site. Despite it being listed as a key wetland, not much is known about its birds or other fauna. The reservoir and its surrounds are believed to provide important habitat for resident, wintering and passage migrant wetland birds. A total of 37 wetland-dependent bird species was found in four visits (DNPWC and IUCN 2003) and five globally threatened species have been recorded including the Lesser Adjutant *Leptoptilos javanicus* (Baral and Inskipp 2005). Other fauna recorded here include the globally threatened smooth-coated otter *Lutrogale perspicillata* and 25 species of fish (DNPWC and IUCN 2003).

The 2003 National Wetland Policy of Nepal encourages the biological inventory of important wetlands sites in Nepal and the use of such information for the conservation, management and wise use of wetlands (HMGN/MFSC 2003). Ornithological surveys and conservation awareness programmes for local communities have been recommended as high priority for the conservation of Jagdishpur (Baral and Inskipp 2005). Following these recommendations, I carried out surveys in 2005–2006 to gather baseline information on avifauna of the site, and to propose conservation measures.

STUDY AREA

Jagdishpur Reservoir (27°35′N 83°05′E, Fig. 1) lies at an elevation of 197 m in the Kapilvastu District of Lumbini Zone, southwest Nepal. This irrigation reservoir was constructed over the location of Jakhira Lake and surrounding agricultural land in the early 1970s. A rock-

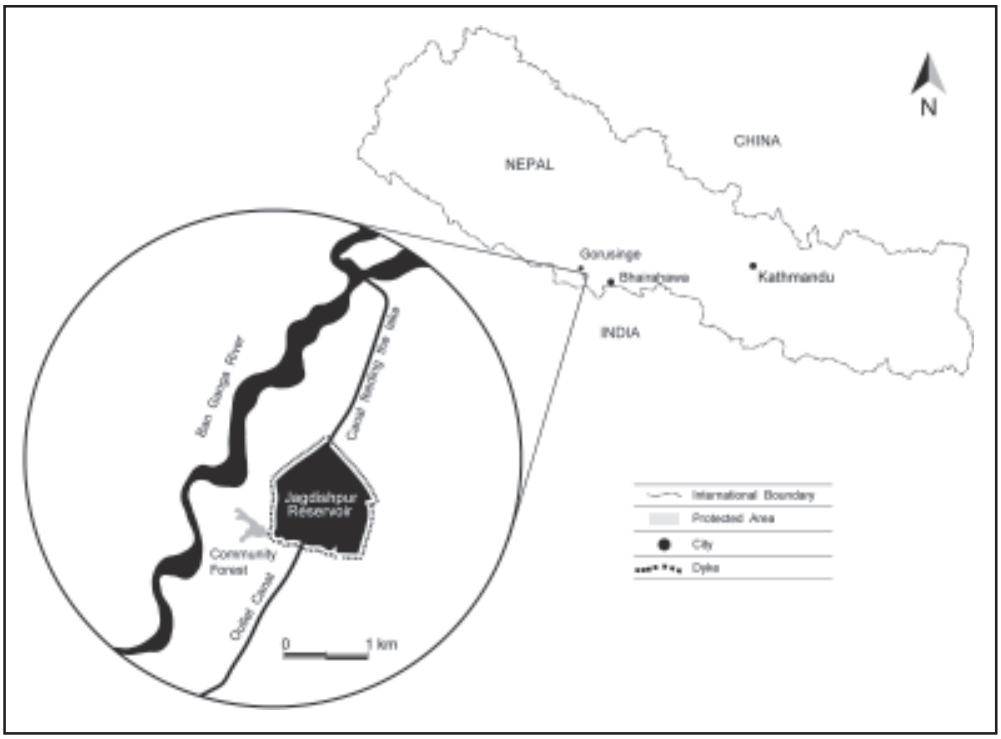

Figure 1. Location and rough map of Jagdishpur Reservoir, Kapilvastu District, Nepal.

filled dyke surrounding the reservoir was constructed in the early 1980s. The reservoir is fed through a canal from the nearby Ban Ganga River that has a catchment area in the Churia Hills. Maximum water depth varies between 7 m in the monsoon and 2 m in drier months. The reservoir is surrounded by cultivated land, which also holds large numbers of birds (L. Gurung verbally 2006).

The reservoir bank is planted mostly with *Dalbergia sissoo* and some *Acacia catechu*. Floating vegetation is dominated by *Nelumbo nucifera*, followed by *Hygrorhiza aristata* and *Potamogetan nodosus*. Submerged plants include *Naja minor*, *Ceratophyllum demersum* and *Hydrilla verticillata*. The reservoir margin holds *Ipomoea carnea* and *Typha* sp. Most aquatic vegetation is submerged, with patches of the lake covered by floating species or occupied by reed swamps.

METHODS

Surveys at Jagdishpur reservoir were conducted on 11 May 2005, 11 October 2005, 6 January 2006 and 23 March 2006. These visits were spread through the year in order to assess seasonal status. All surveys were carried out on foot. Each survey was conducted by two people, one to identify and count the species and the other to write down the data. The surveyors followed a fixed route, starting from the main outlet sluice, then slowly walking around the reservoir in a clockwise direction, and ending at the start point. Surveys were carried out between 08h00 to 12h00, each walk typically lasting 3–4 hr. Birds were identified using 10× binoculars and 20× spotting scopes. Total counts were made of all birds in the reservoir, or outside it but within 500 m of the dam. For species flying in flocks, repeat counts were made and the highest count taken. Informal interviews with members of the local community were used to gather information on conservation issues.

In this account, I follow Bhandari (1998) when classifying species as wetland-dependent. For seasonal status of species, I mostly follow Inskipp and Inskipp (1991).

RESULTS AND DISCUSSION

A total of 108 bird species was recorded from the Jagdishpur Reservoir area (Appendix), nearly half being either winter visitors or passage migrants. Ten species were seen on all four visits. Of these, Lesser Whistling Duck *Dendrocygna javanica* was the most abundant, with 2,000 individuals counted in March. Other high species counts included 6,000 Common Coots *Fulica atra* in January, which is perhaps the highest count for this species in the country. Twelve of the 25 most abundant species are winter visitors or passage migrants in Nepal.

Winter migrants reached peak abundance in January. Other species, mostly resident, were most abundant in March. This may have been due to the lower water levels and consequently higher food availability in March. In addition, most smaller wetlands in the vicinity dry up at this time of the year, and this may act to concentrate birds at perennial waterbodies. Cotton Pygmy Goose *Nettapus coromandelianus*, Red-wattled Lapwing *Vanellus indicus* and Paddyfield Pipit *Anthus rufulus* reached peak abundance in October—these are likely to breed in the reservoir or its vicinity. A colony of Asian Openbill *Anastomus oscitans* has recently been found breeding near Lumbini (Giri 2008). May is usually a significant month for passage migrants in Nepal but this is not reflected in the numbers from Jagdishpur. There are records of Whiskered Tern *Chlidonias hybridus* and Garganey *Anas querquedula* on passage in May 2003 (Baral and Chaudhary 2003).

This survey adds 18 wetland-dependent bird species to the Jagdishpur list prepared by DNPWC and IUCN (2003). Six additional wetland-dependent species, not found during this survey, have previously been recorded (J. Cox *in litt.* to C. Inskipp, Baral and Chaudhary 2003, Choudhary and Giri 2006). This gives a total of 61 wetland-dependent bird species for Jagdishpur (see Appendix for a full list). An additional 57 species were recorded in the reservoir area. The habitat appears particularly suitable for ducks and other large waterfowl, and less suitable for waders.

Several species, listed for the area by DNPWC and IUCN (2003), were not observed during this survey: Cinnamon Bittern *Ixobrychus cinnamomeus*, Yellow Bittern *I. sinensis*, Black-bellied Tern *Sterna acuticauda* and Indian Spotted Eagle *Aquila hastata* (recently split from Lesser Spotted Eagle *A. pomarina*: Parry *et al.* 2002). In total, seven globally threatened species and three Near-Threatened species have been recorded from the reservoir (Appendix). Incorporating all available and reliable bird information, the overall bird list for Jagdishpur comes to 118 species, including seven globally threatened species.

CONSERVATION ISSUES

During this survey, various disturbances, including bird hunting, were observed. Other threats to the site include unsustainable methods of harvesting fish and other natural resources, siltation, deposition of detritus from aquatic macrophytes, water pollution from agricultural chemicals, and invasive alien species such as *Eichhornia crassipes* (DNPWC and IUCN 2003). The dense aquatic macrophyte vegetation indicates an advanced eutrophic status and a high sedimentation rate.

Every year the reservoir is partially drained to collect fish and other resources like snails and edible plants. During this operation, the inflow of water to the reservoir is lessened or stopped and outflow increased. Fishermen working in the reservoir pump water out, often using mechanised pumps. When the water level is less than knee-deep, fish are caught with nets and by hand. Different parts of the reservoir are drained at different times, and in exceptionally dry years, the entire reservoir has occasionally been completely drained to catch fish. The reservoir also contributes apple snails *Pila globosa* and water-chestnut *Trapa bispinosa* for food, cattails *Typha elephantina* for mat-making, and *Ipomoea carnea* for fuelwood (D. Giri verbally 2006, L. Gurung verbally 2006, HSB pers. obs.). Management of the reservoir to promote biodiversity needs study. For example, partial draining may have less of an effect than complete draining of the reservoir. Draining will need to be carried out at those times which minimise impacts on birdlife.

Although the site has been proposed as a bird sanctuary, nothing has been done so far to achieve this. Local people

are reportedly interested promoting the area as a birding and recreational destination (L. Gurung verbally 2006), and this opens up possibilities of tourism-based conservation. Such programmes at Jagdishpur could be linked with the village tourism programme conducted in other areas of Kapilvastu district. However, care must be taken to minimise disturbance to wildlife. For example, current plans include promoting boating on the lake, which is likely to increase disturbance levels.

Active enhancement of habitat quality may also be needed, for example creating shallow mudflats and *Phragmites* marshes, creating nesting islands, and installing nextboxes. While carrying out these and other conservation activities, care must be taken to avoid potential conflict with local people, and various stakeholders should be consulted, including the Village Development Committee, the District Irrigation Office and the Department of National Parks and Wildlife Conservation.

ACKNOWLEDGEMENTS

I would like to thank the Oriental Bird Club (OBC) and the Ramsar Convention Secretariat (RCS), for funding this survey. I thank David Buckingham (OBC), and Pragati Tuladhar and Sandra Hails (RCS) for their support and guidance. Dinesh Giri, Tika Giri, Dhan Bahadur Chaudhary, Mark Mallalieu, Bhesh Raj Ghimire and Yub Raj Basnet assisted in the field. Sharad Singh of Lumbini Buddha Garden Lodge helped with logistics. I am grateful to Carol Inskipp for her support to carry out this survey.

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APPENDIX

A complete checklist, with counts, of birds recorded in Jagdishpur Reservoir. Counts are given for those species recorded in four surveys in 2005 and 2006. For other species, the original source is given. Systematic order follows Inskipp *et al.* (1996).

Species	Status[1]	Count				Source[2]
		May	October	January	March	
LESSER WHISTLING DUCK *Dendrocygna javanica*	R	70	12	600	2,000	
COTTON PYGMY GOOSE *Nettapus coromandelianus*	R	20	31	6	16	
GADWALL *Anas strepera*	W		25	327	188	
FALCATED DUCK *Anas falcata* NT[3]	W					(a)
EURASIAN WIGEON *Anas penelope*	W			150	15	
MALLARD *Anas platyrhynchos*	W		11	56		
NORTHERN SHOVELER *Anas clypeata*	W		12	28	53	
NORTHERN PINTAIL *Anas acuta*	W		5	76		
GARGANEY *Anas querquedula*	W				19	
COMMON TEAL *Anas crecca*	W		176	610		
RED-CRESTED POCHARD *Rhodonessa rufina*	W			112	18	
COMMON POCHARD *Aythya ferina*	W			84	4	
FERRUGINOUS DUCK *Aythya nyroca* NT	W		9	52	11	
TUFTED DUCK *Aythya fuligula*	W			65	10	
COMMON HOOPOE *Upupa epops*	W			2	1	

Species	Status[1]	Count				Source[2]
		May	October	January	March	
Indian Roller *Coracias benghalensis*	R		1	2		
Common Kingfisher *Alcedo atthis*	R		1	4	2	
White-throated Kingfisher *Halcyon smyrnensis*	R		7	9	4	
Pied Kingfisher *Ceryle rudis*	R		1		4	
Green Bee-eater *Merops orientalis*	R		4			
Blue-tailed Bee-eater *Merops philippinus*	S				2	
Indian Cuckoo *Cuculus micropterus*	S		1			
Greater Coucal *Centropus sinensis*	R			2		
Rose-ringed Parakeet *Psittacula krameri*	R			8		
Spotted Owlet *Athene brama*	R		2			
Spotted Dove *Streptopelia chinensis*	R		1	1	4	
Eurasian Collared Dove *Streptopelia decaocto*	R				11	
Sarus Crane *Grus antigone* VU	S				8	
Brown Crake *Amaurornis akool*	R	1				
Baillon's Crake *Porzana pusilla*	W					(b)
Watercock *Gallicrex cinerea*	S	1				
Purple Swamphen *Porphyrio porphyrio*	R		5	49	18	
Common Moorhen *Gallinula chloropus*	W		12	20	21	
Common Coot *Fulica atra*	W		109	6,000	400	
Pintail Snipe *Gallinago stenura*	W					(c)
Common Greenshank *Tringa nebularia*	W		1	2	7	
Green Sandpiper *Tringa ochropus*	W	2				
Pheasant-tailed Jacana *Hydrophasianus chirurgus*	R	8	16			
Bronze-winged Jacana *Metopidius indicus*	R	13	8	2	14	
Little-ringed Plover *Charadrius dubius*	W				2	
Grey-headed Lapwing *Vanellus cinereus*	W		6			
Red-wattled Lapwing *Vanellus indicus*	R	10	37	14	24	
Little Pratincole *Glareola lactea*	S?	15				
Pallas' Gull *Larus ichthyaetus*	PM					(b)
Black-bellied Tern *Sterna acuticauda* NT	R?					(d)
Whiskered Tern *Chlidonias hybridus*	PM					(b)
Black-shouldered Kite *Elanus caeruleus*	R		1	4		
Black Kite *Milvus migrans*	R			2	4	
Egyptian Vulture *Neophron percnopterus* EN	W				2	
White-rumped Vulture *Gyps bengalensis* CR	R			21	24	
Slender-billed Vulture *Gyps tenuirostris* CR	R			2	7	
Himalayan Griffon *Gyps himalayensis*	W			6	32	
Eurasian Griffon *Gyps fulvus*	W				2	
Eurasian Marsh Harrier *Circus aeruginosus*	W		1	2	2	
Short-toed Snake Eagle *Circaetus gallicus*	W				1	
Pied Harrier *Circus melanoleucos*	W			1	2	
Shikra *Accipter badius*	R				2	
Indian Spotted Eagle *Aquila hastata* VU	R					(d)
Greater Spotted Eagle *Aquila clanga* VU	W			1		
Common Kestrel *Falco tinnunculus*	W		1	2	1	
Peregrine Falcon *Falco peregrinus calidus*	W			1		
Little Grebe *Tachybaptus ruficollis*	R	14	17	46	57	
Great crested Grebe *Podiceps cristatus*	W			2		
Darter *Anhinga melanogaster*	W			1		
Little Cormorant *Phalacrocorax niger*	R	40	2	2	75	
Large Cormorant *Phalacrocorax carbo*	W		1		1	
Little Egret *Egretta garzetta*	R	12	1	8	41	
Grey Heron *Ardea cinerea*	W			6	5	

Species	Status[1]	Count				Source[2]
		May	October	January	March	
Purple Heron *Ardea purpurea*	R	8		2	5	
Great Egret *Casmerodius albus*	R	5	1	2	9	
Intermediate Egret *Mesophoyx intermedia*	R	8		15	29	
Cattle Egret *Bubulcus ibis*	R	40	21		54	
Indian Pond Heron *Ardeola grayii*	R	16	24	5	12	
Little Heron *Butorides striatus*	R?	2				
Yellow Bittern *Ixobrychus sinensis*	S, R?					(d)
Cinnamon Bittern *Ixobrychus cinnamomeus*	S, R?					(d)
Black Ibis *Pseudibis papillosa*	R	12		23	23	
Asian Openbill *Anastomus oscitans*	R	30	25	73	105	
White Stork *Ciconia ciconia*	PM					(c)
Lesser Adjutant *Leptoptilos javanicus* VU	R	1	3	4	13	
Brown Shrike *Lanius cristatus*	W			1		
Long-tailed Shrike *Lanius schach*	R			2	2	
Rufous Treepie *Dendrocitta vagabunda*	R			3	1	
House Crow *Corvus splendens*	R		6		12	
Large-billed Crow *Corvus macrorhynchos*	R			40	5	
Large Cuckoo Shrike *Coracina macei*	R			1		
Black-hooded Oriole *Oriolus xanthornus*	R				1	
Black Drongo *Dicrurus macrocercus*	R		5	40	8	
Red-throated Flycatcher *Ficedula parva*	W		2	10	6	
Bluethroat *Luscinia svecica*	W			2	4	
Black Redstart *Phoenicurus ochruros*	W			2		
Common Stonechat *Saxicola torquata*	W			10	2	
Pied Bushchat *Saxicola caprata*	R		4	8	7	
White-tailed Stonechat *Saxicola leucura*	W				2	
Asian Pied Starling *Sturnus contra*	R		2	54		
Common Myna *Acridotheres tristis*	R				2	
Pale Martin *Riparia diluta*	W			3		
Plain Martin *Riparia paludicola*	W			50		
Barn Swallow *Hirundo rustica*	W			2		
Red-rumped Swallow *Hirundo daurica*	W			100		
Zitting Cisticola *Cisticola juncidis*	R		2		4	
Ashy Prinia *Prinia socialis*	R		1	2	5	
Plain Prinia *Prinia inornata*	R		3	12	7	
Blyth's Reed Warbler *Acrocephalus dumetorum*	W			1		
Common Chiffchaff *Phylloscopus collybita*	W			25	3	
Smoky Warbler *Phylloscopus fuligiventer*	W			3		
Hume's Warbler *Phylloscopus humei*	W			5		
Greenish Warbler *Phylloscopus trochiloides*	W			1	3	
Rufous-winged Lark *Mirafra assamica*	R		4	2		
Ashy-crowned Sparrow Lark *Eremopterix grisea*	R				2	
White Wagtail *Motacilla alba*	W			1	28	
Citrine Wagtail *Motacilla citreola*	W		10	1		
Grey Wagtail *Motacilla cinerea*	W			4	1	
Paddyfield Pipit *Anthus rufulus*	R		32	5	23	
Tawny Pipit *Anthus campestris*	W		1		1	
Olive-backed Pipit *Anthus hodgsoni*	W				6	
Black-breasted Weaver *Ploceus benghalensis*	R			70		
Red Avadavat *Amandava amandava*	R			6		

[1] Status. R: resident, W: winter visitor, S: summer visitor, PM: passage migrant, ?: status uncertain
[2] Source. (a) Choudhary and Giri 2006, (b) Baral and Chaudhary 2003, (c): Cox 1978, (d): DNPWC and IUCN 2003.
[3] IUCN Red List status follows BirdLife International (2008). NT: Near Threatened, VU: Vulnerable, EN: Endangered, CR: Critically Endangered.