

The Indian Sunderbans: an important wintering site for Siberian waders

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We report the first systematic survey of wintering waders in the Indian Sunderbans, West Bengal, during Jan and Feb 2005. One object was to search for the globally-endangered Spoon-billed Sandpiper. However, none were found. In the area surveyed, 7,758 waders were counted of 32 species. Long-distance, arctic-breeding migrants comprised more than half the species and 70% of total numbers. Extrapolation to all areas of suitable habitat suggests that the nine most abundant species have a combined wintering population of about 35,000 and that the total wader population is not less than 40,000. This figure and the fact that the populations of all nine abundant species are estimated to exceed 1% of their flyway populations indicate that the Indian Sunderbans is a key site for wintering waders in south Asia.

INTRODUCTION

The Sunderbans (literally ‘beautiful forests’), in the Ganges delta on the border between the Indian state of West Bengal and Bangladesh, are well-known for their famous Royal Bengal Tiger *Panthera tigris* population. The tiger is the main reason for the protection of its mangrove forest habitat as a National Park and World Heritage site. However, little is known about the waterbirds of the Sunderbans and the significance of the area for migrant waders.

There are few published accounts or reports about the birds of the area and even fewer refer to waders: Fawcett (1944) (Pied Avocet *Recurvirostra avosetta* recorded in 1943), Mitra (1972) (6 wader species on 26–27 Feb 1972), Mukherjee (1959) (3 breeding wader species, Jul–Oct 1957), (1975) (10 species of waders recorded as ‘seasonal visitors’) and (1976) (food habits of 3 wader species), Mandal & Nandi (1989) (5 resident and 19 migratory wader species), Anon. (1993) (13 wader species), Chaudhuri (1999) (3 wader species, 14–16 Aug 1998), Gupta 1999 (6 wader species, 14–16 Aug 1998), Mookherjee 1999 (7 wader species), Mookherjee *et al.* (1999) (12 wader species at Dabhu Char, 1990–1997), Tiwari (2000) (11 wader species, 4–5 Jan 2000), Sharma (2003) (Spoon-billed Sandpiper *Eurynorhynchus pygmeus*), Sen (2004) (16 wader species, 29–30 Dec 2003, 26–28 Mar 2004, 4–5 Jun 2004). These references collectively deal with 40 species of waders recorded in the area. The Eurasian Oystercatcher *Haematopus ostralegus* was mentioned as a breeding wader in the neighbouring Bangladesh Sunderbans (Stanford 1937), but only as a migrant elsewhere.

In this paper, we report the results of an international ornithological expedition to the Indian Sunderbans in Jan and

Feb 2005. The principal object was to search for the globally-endangered Spoon-billed Sandpiper, but another major purpose was to carry out a thorough survey to evaluate the area’s importance as a site for wintering waterbirds, particularly waders.

STUDY AREA AND METHODS

In Jan and early Feb 2005, twelve ornithologists from five countries carried out counts of waterbirds in the Indian Sunderbans. The main study was carried out during an aggregate of 15 days between 3 and 28 Jan (except for 8–13 Jan). Haribangar Island was revisited by two observers on 14 and 15 Feb. Surveys were conducted mainly from two base stations, Bakhali in the west near the coast and Anpur Island in the centre of the eastern Sunderbans, close to the Bangladesh border (Fig. 1). From these centres, two teams surveyed the channels and outer islands in boats (see photos).

The Sunderbans is a huge area of protected mudflats and sandbanks mostly vegetated with mature mangrove forest stretching over 9,630 km² (Vyas 2004). It is the largest mangrove area in South Asia and possibly in the world. The Indian Sunderbans is protected as a Biosphere Reserve and includes one national park, one tiger reserve and three wildlife sanctuaries: Sajnekhali, Halliday and Lothian Island. It has also been declared a World Heritage Site. The Indian Sunderbans extends to 4,264 km² of which 2,585 km² is the Sunderban Tiger Reserve and 1,330 km² the core area National Park. The Sajnekhali Wildlife Sanctuary (362 km²) lies within the buffer zone to the north of the Netidhopani and Chadkhali forest blocks. There are two small sanctuaries within the Biosphere Reserve: the 5.8 km² Halliday Island



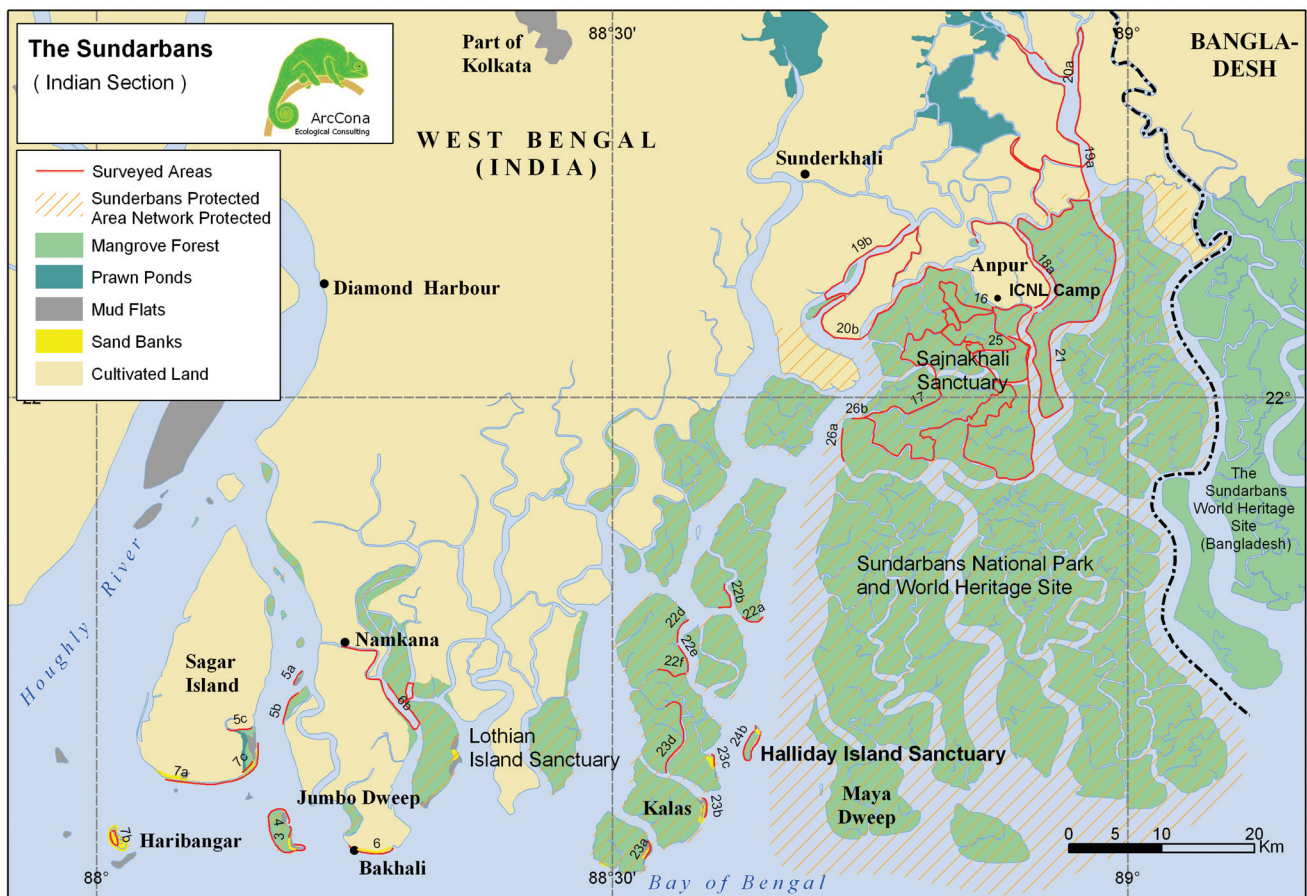


Fig. 1. The Indian Sunderbans: the surveyed area and protected area status.

Wildlife Sanctuary and the 39 km² Lothian Island Wildlife Sanctuary.

The Sunderbans comprise a large variety of mostly forested habitats, in different stages of succession, but also coastal sandbanks, channels and creeks with mudflats exposed at low tide. Much of the area is suitable for hosting a large waterbird population, but no survey has yet been conducted to assess the conservation significance of the area for waterbirds, particularly waders.

The Sunderbans stretch from the Houghly in the west (India) to the Meghna in the east (Bangladesh), both of which are major channels of the Ganges. The following islands on the outer edge of the delta, but part of the Sunderbans, were also surveyed: Sagar Island, Jumbo Dweep and Kalas Island (Fig. 1). Although outside the park, Namkana and Bakhali are considered part of the Sundarbans and were also surveyed.

In most parts of the park it is not permitted to go ashore because of the risk of attack by tigers. Moreover nearly 50% of the park is strictly protected with access prohibited. Most surveys were therefore carried out from motorboats, but we were given permission to do surveys from the shore on the outer islands of Jumbo Dweep, Kalas and Halliday. Most of the channels were surveyed from the boat with the motor running, but in some places where many waders were aggregated we stopped the motor to complete the count. The surveys were mainly carried out at high tide, but logistics meant that some remote areas had to be surveyed at low tide rather than not at all. Several areas in the Sunderbans Park were surveyed two or three times and at different stages of the tidal

cycle to assess tidal differences in numbers and distribution. In general, no major differences were recorded, and although the waders tended to aggregate at high tide, they occurred in similar numbers to those counted on the mudflats in the same areas at low tide. On each boat, 4–6 observers covered both channel sides with binoculars. Telescopes were also used on the shore or from the boats without the engine running. All water birds were counted, including herons and kingfishers. Double counting was avoided by not disturbing the birds. When birds flew off in the direction the boat was travelling, we tried not to count them again. Generally we counted birds individually rather than in estimated blocks of, for example, tens or hundreds. Therefore, for the areas covered, we consider that our counts were accurate to within about 2%. However, we found that some species, especially herons, rails and snipes, were more difficult to record because of their secretive habits or camouflage so these may have been under-recorded.

Overall, 47 km² of outer sand banks and mudflats and 488 km of river channels and island coast lines were surveyed (Fig. 1). We estimate that this amounts to about 30% of the suitable mudflats along the creeks and channels of the Sunderbans outside the inaccessible core area.

RESULTS

Sixty two waterbird species were recorded in the Indian Sunderbans half of which (32 species) were waders (Table 1). Waders comprised the most numerous group, totalling 7,758.



Table 1. Waders observed in the Indian Sunderbans in January and February 2005.

Status: B = Local breeding bird, S = Short distance migrant, M = Medium-distance migrant (within Asia), L = Long-distance migrant (Siberian Arctic) (Wetlands International 2002). Here we use the definition of the Arctic region adopted by CAFF (2001).

0 = species not recorded.

NEP = no estimate possible, either because the area surveyed was too small in relation to the area of potential habitat for meaningful extrapolation or because the extent of the potential habitat could not be estimated.

* Estimate exceeding 1% of the flyway population according to Wetlands International (2002).

Species	Sunderbans January	Sand- banks	Mud- flats	Haribhanga 14–15 Feb	Status	Breeding area	Estimated total for the Indian Sunderbans
Great Thick-knee <i>Esacus recurvirostris</i>	7	5	2	0	B?	Local	NEP
Small Pratincole <i>Glareola lactea</i>	31	29	2	33	B	Local	NEP
Grey-headed Lapwing <i>Vanellus cinereus</i>	97	0	97	0	M	East Asia	NEP
Red-wattled Lapwing <i>Vanellus indicus</i>	4	0	4	0	B	Local	NEP
Pacific Golden Plover <i>Pluvialis fulva</i>	532	75	457	60	L	Arctic Siberia	3,000*
Grey Plover <i>Pluvialis squatarola</i>	67	61	6	2	L	Arctic Siberia	NEP
Little Ringed Plover <i>Charadrius dubius</i>	11	0	11	0	B	Local	NEP
Kentish Plover <i>Charadrius alexandrinus</i>	38	24	14	22	S	Local India	NEP
Lesser Sandplover <i>Charadrius mongolus</i>	2,373	1,486	887	180	L/M	Arctic Siberia & East Asia	10,000*
Greater Sandplover <i>Charadrius leschenaultii</i>	514	458	56	26	M	East Asia	NEP
Asian Dowitcher <i>Limnodromus semipalmatus</i>	1	0	1	0	M	Central Asia	NEP
Black-tailed Godwit <i>Limosa limosa</i>	16	0	16	0	M	Central Asia	NEP
Bar-tailed Godwit <i>Limosa lapponica</i>	2	2	0	0	L	Arctic Siberia	NEP
Whimbrel <i>Numenius phaeopus</i>	656	57	599	0	L	Arctic Siberia	3,800*
Eurasian Curlew <i>Numenius arquata</i>	218	36	182	18	M	Central Asia	1,300*
Spotted Redshank <i>Tringa erythropus</i>	9	0	9	0	L	Arctic Siberia	NEP
Common Redshank <i>Tringa totanus</i>	654	116	538	62	M	Central Asia	3,900*
Marsh Sandpiper <i>Tringa stagnatilis</i>	1	0	1	0	M	Central Asia	NEP
Common Greenshank <i>Tringa nebulosa</i>	45	29	16	6	L	Siberia	NEP
Green Sandpiper <i>Tringa ochropus</i>	1	0	1	0	M	Siberia	NEP
Wood Sandpiper <i>Tringa glareola</i>	6	0	6	0	L	Arctic Siberia	NEP
Terek Sandpiper <i>Xenus cinereus</i>	368	102	266	43	L	Arctic Siberia	2,200*
Common Sandpiper <i>Actitis hypoleucos</i>	777	26	751	12	M	Siberia	4,200*
Ruddy Turnstone <i>Arenaria interpres</i>	59	53	6	0	L	Arctic Siberia	NEP
Great Knot <i>Calidris tenuirostris</i>	20	19	1	0	L	Arctic Siberia	NEP
Red Knot <i>Calidris canutus</i>	1	0	1	0	L	Arctic Siberia	NEP
Sanderling <i>Calidris alba</i>	9	9	0	0	L	Arctic Siberia	NEP
Red-necked Stint <i>Calidris ruficollis</i>	122	122	0	350	L	Arctic Siberia	NEP
Little Stint <i>Calidris minuta</i>	791	360	431	2,800	L	Arctic Siberia	5,000*
Temminck's Stint <i>Calidris temminckii</i>	27	0	27	0	L	Arctic Siberia	NEP
Curlew Sandpiper <i>Calidris ferruginea</i>	292	25	267	500	L	Arctic Siberia	1,500*
Dunlin <i>Calidris alpina</i>	1	1	0	0	L	Arctic Siberia	NEP
Total	7,758			4,114			35,000

Of the 32 wader species recorded only four are known to breed locally (Table 1). The rest are short/medium-distance migrants from other parts of Central and East Asia (9 species) or long-distance migrants from arctic Siberia (18 species or 56% of the total) (Wetlands International 2002). The most numerous wader species were the long-distance migrants which comprised 70% of all waders counted; short/medium-distance migrants comprised 29% and local breeders 1%.

Apart from the waders, we also recorded nine heron species, six ducks, four gulls, four terns, three cormorants, three rails, one stork and five kingfishers.

DISCUSSION

This was the first systematic survey of waterbirds in the Indian Sunderbans. Our count of 7,758 waders is considerably more than the 335 reported in 1998 and 293 in 1999 by Li & Mundkur (2004), and must reflect the greater survey

effort rather than any change in numbers. However, neither our survey nor any other has covered the Indian Sunderbans fully. Therefore it is only possible to make rough estimates of the area's total winter population for nine species. We have done this by extrapolating our counts to the total area of available habitat (Table 1, last column). No such estimate is possible for the remainder of the wader species recorded either because the area surveyed was too small in relation to the area of potential habitat for meaningful extrapolation or because the extent of the potential habitat could not be estimated. However, all nine of the species for which we could make estimates are shown to have Indian Sunderbans populations exceeding 1% of the relevant flyway populations (Wetlands International 2002), indicating the site's prime importance. We estimate the combined total of these nine species at around 35,000 (Table 1). Although the other 23 species are probably far less numerous, we judge that the total number of waders supported by the Indian Sunderbans in winter is



unlikely to be less than 40,000.

Taking into account the high figures from 14–15 Feb at Haribangar (Table 1), the proportion of waders in the Sunderbans with an arctic origin increases to almost 80%. However, birds present in February might include northbound migrants so this could be misleading.

Some of the wintering populations of the medium distance migrants, such as Common Sandpiper (count 777, estimate 4,200) and Common Redshank (total number = 654, estimate 3,900), might also originate partly from arctic breeding grounds, which could mean that the proportion of arctic birds is even higher. On the other hand, the most common species, Lesser Sandplover, is widely distributed in Siberia, China and Mongolia, and only the arctic subspecies *mongolus* and *stegmanni* breed in large numbers in the Arctic. Therefore the breeding grounds of the 2,373 counted (10,000 estimated) will not be clear until their subspecific status is determined.

Among the waders breeding entirely in the Arctic are the *Calidrid* sandpipers of which the most common is Little Stint (count 791, estimate 5,000, with 2,800 just on Haribangar in mid Feb, Table 1). Other sandpipers recorded in significant numbers were Curlew Sandpiper and, surprisingly in view of past records, Red-necked Stint. We recorded 20 Great Knots and a single Red Knot, which is consistent with other recent observations of small numbers of both species at several different locations suggesting they might occur regularly. Mukherjee (1975) mentions only four *Calidrid* sandpipers as wintering in the Sunderbans (Little Stint, Red-necked, Stint, Curlew Sandpiper and Great Knot) so it is possible that Red Knot is a recent addition.

The Sunderbans are shown to be particularly important for Whimbrel (count 656, estimate for the Indian Sunderbans 3,800), Pacific Golden Plover (count 532, estimate 3,000), and Terek Sandpiper (count 368, estimate 2,200). These species tend not to aggregate and only rarely build in loose flocks for roosting – hence they are difficult to count. We found them scattered fairly evenly across the mudflats and along the margins of channels and creeks. The survey covered only about a sixth of the potential habitat of these species in the whole of the Indian Sunderbans (including the inaccessible core area). Therefore we estimated their total populations to be six times higher than our counts. However, for Whimbrel in particular, this could underestimate the true population in view of their willingness to roost among the mangroves.

The maximum number of Terek Sandpipers recorded in the whole of India during 1997–2001 was only 96 in 2001, far less than our Sunderbans count and estimate. Indeed our estimate is higher than the total counted in the whole of Asia in 1997–2001, though the Asian population is estimated to be as high as 60,000–150,000 (Li & Mundkur 2004). In India, Terek Sandpipers have only previously been recorded in substantial numbers in the Gulf of Mannar in the extreme south-east (S. Balachandran unpub. info.). It now appears that the Sunderbans support the highest numbers in the country.

Despite an intensive search for Spoon-billed Sandpipers in sites from where they were reported in the past both within the tiger reserve and just outside (Sharma 2003) none were seen. It therefore seems unlikely that the species occurs in any significant numbers. Possibly it occurs irregularly on the outer islands and sandbanks in the delta where single birds have been observed by several local birdwatchers, e.g. on Sagar Island (Sharma 2003). Observations in neighbouring Bangladesh suggest that the species is most likely to prefer the outer islands and sandbanks, which undergo constant

change owing to the dynamics of the Ganges delta (Thompson & Johnson 2003).

The Grey-headed Lapwing, which breeds mainly in NE China, appears to occur in the Sunderbans in some numbers. The total population is not known, but believed to be in the range 25,000–100,000 (Li & Mundkur 2004). Our count of 97 is likely to be a considerable underestimate of the numbers in the vicinity of the Sunderbans as past records indicate that they occur commonly outside the reserve. Mookherjee *et al.* (1999) noted 70 during mid-winter counts in 1993 in Dabur Char, near Kolkata (Calcutta), just outside the reserve, and Tiwari (2000) saw a flock of over 100 north of Sonakhali on 4 Jan 2000.

The Great Thick-knee is one of the few waders that occurs in the Sunderbans all year and might breed. However, it is possible that the birds are from nesting areas nearby. Our records of a combined total of seven birds on four occasions suggest that the species is quite scarce in the Sunderbans where it has only ever been recorded as feeding on fiddler crabs *Uca*. If this is the thick-knee's main prey, it must be restricted to a quite limited area around the mangroves and adjacent shorelines where *Uca* occur. However, the diet is known to vary considerably elsewhere (Mundkur 1990) so perhaps the species has been overlooked.

The status of the Great Thick-knee in Asia is not fully understood and requires further investigation. During 1997–2001, the maximum annual total count of the species in the Asian Waterbird Census (AWC) was only 300 of which 180 were in India (Li & Mundkur 2004). However, it is likely that it is under-recorded by the AWC because its sparse distribution along inland rivers means that is largely missed by systematic counts. It is not considered globally threatened but its conservation requires more attention.

Eleven species were not seen during our visit but have been recorded in the Sunderbans in the past (see references cited in the introduction). These are: Pintail Snipe *Gallinago stenura*, Common Snipe *G. gallinago*, Greater Painted-Snipe *Rostratula benghalensis* (breeding?), Pheasant-tailed Jacana *Hydrophasianus chirurgus* (breeding), Bronze-winged Jacana *Metopidius indicus* (breeding), Eurasian Oystercatcher *Haematopus ostralegus*, Black-winged Stilt *Himantopus himantopus* (breeding), Pied Avocet *Recurvirostra avosetta*, Common Ringed Plover *Charadrius hiaticula*, Yellow-wattled Lapwing *Vanellus malabaricus* (breeding, Mukherjee 1959) and River Lapwing *V. duvaucelii* (breeding?). Two other species: Eurasian Thick-knee *Burhinus oedipnemos* and Caspian Plover *Charadrius asiaticus* are included as occurring in the Sunderbans by Chatterjee (2004). However, this is a checklist that derives from other sources that are not cited. Caspian Plover is likely to be an error as it is an extreme rarity in the Indian subcontinent.

CONCLUSION

This study shows for the first time that the Indian Sunderbans is a key site for wintering waders of which at least nine occur in numbers exceeding the internationally recognised 1% threshold for site-importance. We counted 7,758, but estimate a total population of at least 40,000. Almost 80% of those recorded were arctic-breeding, long-distance migrants, such as Little Stint and Curlew Sandpiper. However, the area does not seem to be important for the globally-threatened Spoon-billed Sandpiper. The Sunderbans also hosts significant numbers of Grey-headed Lapwings. It is strongly recommended



that wader surveys are continued on an annual or biannual basis and that the Sunderbans is included in the network of sites monitored in West Bengal.

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Great Thick-Knee in the Indian Sunderbans. (photo C. Zöckler)

Wader survey from boat. (photo C. Zöckler)



Mudflats at Jumbo Dweep. (photo C. Zöckler)

Survey team at Jumbo Dweep. (photo C. Zöckler)



Lesser Sandplovers and a Pacific Golden Plover roosting on mudflats. (photo K. Webb)

Survey work on mudflats planted with mangroves in the Indian Sunderbans. (photo K. Webb).

