

**REPORT ON SHOREBIRD MONITORING
AT THE MAI PO INNER DEEP BAY RAMSAR SITE**

2000-2001 REPORT

G.J. Carey and Y.T. Yu

Introduction

Systematic, long-term monitoring of waterbirds in the Mai Po and Inner Deep Bay Ramsar Site commenced in March 1998. This project is administered, coordinated and executed by the Hong Kong Bird Watching Society, and is funded by the Agriculture, Fisheries and Conservation Department. Counts of shorebirds (also called waders) form one part of this programme, the other components being monthly counts of waterbirds in the area and surveys of ardeid nesting colonies. This report concerns the shorebird monitoring component for autumn 2000 and spring 2001.

Methodology

During spring and autumn migration shorebird migrants feed on the intertidal mudflats of Deep Bay and, during the high tide period, roost in the hinterland. The size and geographic layout of Deep Bay is such that it is not viable to count shorebirds when they are feeding in Deep Bay, except for a short period immediately after the tide has withdrawn past the two 'boardwalk' hides situated at the edge of the bay (facilities provided by the WWF-HK Mai Po Marshes Nature Reserve - see map 1). Consequently, counts need to be made during this relatively short window, but mainly during high tide when birds are roosting inland. Since the mid 1980s management activities at the Mai Po Marshes NR have generally ensured that there are suitable roosting areas on the reserve that allow counts to be made with a relatively high degree of accuracy for many species. Depending on the height of the tide, this high tide period when full counts can realistically be made lasts up to four hours, in addition to the time spent in the boardwalk hides.

However, on some days the tide does not reach a height sufficient to force birds to roost inland or even to move close to the boardwalk hides, which means that accurate counts cannot be made. Consequently, the census period is divided into 'blocks' of days that are long enough to ensure the likely occurrence of a high tide

sufficient to allow at least one count to be made, yet short enough to ensure that the majority of birds utilising the Bay during that season could be recorded.

Taking into account these factors the following schedule is used:

- 22 March to 17 May: one count every block of three days
- 18-31 May: one count per week
- 1 June to 15 July: two counts per month
- 16 July to 4 November: one count per week

When possible, during late March and the whole of April, two counts are carried out in each block of three days. This is because turnover for some species may well be sufficiently great for such frequent counting to be required, and because on some days some species simply do not 'perform' and prove impossible to count accurately.

The equipment used consisted of 8x or 10x binoculars and a telescope with wide angle 32x or 50x eyepieces. The procedure for each count was as follows:

- count birds on the rising tide, beginning at a tidal height of around 1.5m.
- count birds roosting in Mai Po NR using a bicycle (essential to complete the count during the time available).
- count birds on the falling tide until such a time as counting is no longer possible due to distance from the observer.

In some cases where counts were made on days with a relatively low early morning or late afternoon high tide, counts were made prior to high tide on the reserve, where night-time roosts of waders were situated. Counts were largely carried out by the authors of this report, with the help of Richard Lewthwaite (twice) and Karl Ng (once).

When counting from the boardwalk hides at the edge of Deep Bay, the emphasis is on counting species that do not generally roost on the reserve or are difficult to count there, primarily smaller species such as the sand plovers, Broad-billed Sandpiper and Red-necked Stint, but also Bar-tailed Godwit. The sand plovers, stints and Broad-billed Sandpipers have roosted away from Mai Po NR for some years now,

and appear to be fly up the Shenzhen River in the direction of Ma Tso Lung to an unknown roost site. In addition, however, and where possible, counts of species already counted on the reserve were also made as a method of checking or refining numbers, in particular Curlew Sandpiper which is usually the most numerous species and may constitute up to 50% of shorebirds present on any given date. Species that have a tendency to arrive *en masse* at the mudflat when the tide is falling are suitable for such counts; Tringa sandpipers, although numerous, generally behave differently arriving in small groups over a longer period of time, and can rarely be checked this way.

In addition to identification and counting, records were also made of birds carrying coloured leg-flags most of which were attached in Australia, and in autumn, where possible, birds were aged as adults, non-adults, juveniles or first-summer birds.

Finally with regard to methodology, it should be noted that the provision through habitat management by WWF-HK of suitable roosting areas for shorebirds is essential to the success of this monitoring programme. At present, the great bulk of larger shorebirds roost within the reserve area, which means that using a bicycle on most days a single experienced observer can make an accurate count of the number of birds present. During autumn 2000 and spring 2001 roosting shorebirds were distributed in ponds 8, 11 and 16/17 (see map 1). There were no phenomena that were considered to have significantly affected the accuracy of counts.

As regards waders such as Red-necked Stint and Greater Sand Plover, which at present do not generally roost on the reserve, these can generally be counted accurately on the falling tide; the falling tide cannot be relied on for the larger shorebirds, however. It is important to note that should significant roosts form elsewhere in the Deep Bay area in the future, then provision will need to be made to ensure that these birds are counted simultaneously with birds roosting at Mai Po in order to maintain the accuracy of counts and of the monitoring programme. Proposals to create further wader scrapes in the Deep Bay area must be viewed with this in mind. At present, it would appear that Mai Po Nature Reserve is providing adequate areas for those waders that wish to roost there. In addition, as far as is known, there are not significant numbers of shorebirds using Tsim Bei Tsui as a roosting area.

Consideration is now being given to habitat management at Mai Po Nature Reserve that would enhance its attractiveness and capacity as a shorebird roosting site.

Results

Results of all wader counts are presented in full in Appendix 1. The previous report (Carey and Yu 2000) detailed the results of shorebird counts during autumn 1999 to spring 2000; this reports details those for autumn 2000 to spring 2001.

Autumn 2000

As can be seen from Figure 1, the total number of shorebirds recorded during autumn 2000 reached a shallow peak in late July and August, with the highest aggregate count of all waders being 1415 on 29 July. Subsequently, the end of August and beginning of September saw a decline, followed by a gradual rise from early September to the end of the survey period in early November. The peak count at this time occurred on 29 October when 4212 shorebirds were recorded.

This initial peak largely comprises passage migrants. At this time, peak counts of 316 Greater Sand Plovers, 799 Common Redshanks, 576 Common Greenshanks, 21 Terek Sandpipers, nine Asian Dowitchers and 40 Curlew Sandpipers were recorded. The count of Greater Sand Plovers continues the relatively high autumn numbers that were noted in 1999, when the peak autumn count of 350 was recorded.

It appears from Figure 1 that for some species the first winter visitors began to arrive in early September. Analysis of the patterns of occurrence of individual species (see Figures 2-19) indicates that wintering birds may begin to arrive at the following times for the following species:

Pacific Golden Plover – early October (Figure 3)

Kentish Plover – mid October (Figure 4)

Grey Plover – latter part of September (Figure 5)

Lesser Sand Plover – mid September (Figure 6)

Black-tailed Godwit – early September (Figure 8)

Eurasian Curlew – early September (Figure 11)

Spotted Redshank – second week of October (Figure 12)

Marsh Sandpiper – early September (Figure 14)

Common Greenshank – early September (Figure 15)

Species that occur primarily as passage migrants in the latter half of the autumn are

Bar-tailed Godwit (Figure 9), Whimbrel (Figure 10), Wood Sandpiper (Figure 16), Great Knot (Figure 17), Red Knot (Figure 18) and Broad-billed Sandpiper (Figure 19).

Winter 2000-2001

A minimum aggregate total of 12,420 waders was recorded wintering in Hong Kong, very similar to the 12,114 recorded in winter 1999-2000. This figure is achieved by summing the peak counts of each species during the midwinter waterbird counts of December, January and February. The bulk of birds, approximately 94%, comprised Pied Avocet (1926), Kentish Plover (2372), Grey Plover (312), Dunlin (3100), Black-tailed Godwit (366), Eurasian Curlew (810), Spotted Redshank (512) and Marsh Sandpiper (1171). The count of Marsh Sandpipers is the highest on record for this time of year.

Spring 2001

The figure for the minimum number of birds passing through (the sum of peak counts for each species) was 15,925, somewhat higher than the equivalent figure of the previous two years (13,163 in 1999, and 13,174 in 2000). When some estimate is made of turnover, that figure becomes 16,804, very similar to the previous two years (16,229 in 1999, and 16,479 in 2000). Turnover was estimated in a crude manner by calculation on the basis of obvious troughs and peaks. However, this could only be done for a small number of species, and the actual pattern of turnover is likely to be more complex and less visible. The peak day count was 11,046 on 26 April, which is very similar to the 11,127 counted in spring 1998, the highest single day total since the Waterbird Monitoring Programme commenced.

Relatively high peak spring counts were noted for Grey Plover (39), Great Knot (560 - the highest count on record in Hong Kong), Curlew Sandpiper (5770), Far Eastern Curlew (14), Common Redshank (1980), Marsh Sandpiper (1529), Common Greenshank (1230 – the third highest spring count on record) and Terek Sandpiper (368). Relatively low peak spring counts were noted for Greater Sand Plover (410), Spoon-billed Sandpiper (only one individual was noted) and Asian Dowitcher (49).

Summer

As is to be expected, the number of waders recorded during the summer was low, though the sum of peak counts for each species during June was 284, which is

significantly higher than the previous two years. It is likely that many of these were first-summer birds in moult. The most numerous species was Terek Sandpiper, the peak count of which was 116.

Total numbers recorded

In an attempt to estimate the actual number of migrant waders that utilised the Mai Po and Inner Deep Bay Ramsar Site during the 12-month period from July 1999 to June 2000, the peak winter (defined as December to February) count obtained during winter waterbird counts can generally be added to the estimated minimum number of birds passing through during the spring and autumn migration seasons (see Table 1). For some species, however, it is not possible to rule out some overlap in individuals occurring in different seasons; consequently, such records (marked by a dash in Table 1) are excluded from the calculation. Thus, birds present during the summer are not certainly different from some of those counted in spring or autumn, and so are not included in this calculation.

With regard to the number of birds passing through during each migration season, the estimate of the minimum number of individuals occurring is arrived at by taking the peak count or by summing the number of 'new' birds between successive peaks and troughs where such a pattern was observed and where it was felt that such peaks included an element of newly-arrived birds.

It can be seen that a minimum of 29,580 shorebirds utilised the Ramsar Site during the 12-month period from July 2000 to June 2001, slightly lower than the equivalent figures of 31,387 for the period from July 1999 to June 2000, and 31,115 for July 1998 to June 1999. Of this total, 19,524 were migrant shorebirds recorded during autumn and spring migrations, with 16,804 occurring on spring passage. It should be noted that these are minimum figures; the spring total in particular probably underestimates the number of birds passing through as only minimum turnover rates have been assumed for some species and for others no turnover rate has been postulated.

Shorebird turnover rates in Hong Kong have yet to be determined; however, Howes and Bakewell (1989) quote studies using marked birds in Morocco and Malaysia as indicating that the total number of shorebirds using a given area during migration lies in the range 3-4.5 times the peak daily count. Using this a basis for calculation, with

peak day counts of 11,046 in spring and 1,415 in early autumn, Deep Bay may have supported in the range 37,383 to 56,075 migrant shorebirds during 2000-2001.

Table 1. Estimated minimum number of shorebirds utilising Deep Bay during the 12-month period July 2000 to June 2001.

| species | autumn peak | winter peak | spring peak | spring total | total |
|--|-------------|-------------|-------------|--------------|-------|
| Black-winged Stilt <i>Himantopus himantopus</i> | 389 | - | 54 | 54 | 443 |
| Pied Avocet <i>Recurvirostra avosetta</i> | | 1926 | - | | 1926 |
| Oriental Pratincole <i>Glareola maldivarum</i> | 2 | | 2 | 2 | 4 |
| Little Ringed Plover <i>Charadrius dubius</i> | 2 | 247 | 4 | 4 | 253 |
| Kentish Plover <i>C. alexandrinus</i> | 3 | 2372 | - | | 2375 |
| Lesser Sand Plover <i>C. mongolus</i> | 6 | 6 | 41 | 41 | 53 |
| Greater Sand Plover <i>C. leschenaultii</i> | 316 | | 410 | 512 | 828 |
| Pacific Golden Plover <i>Pluvialis fulva</i> | 45 | 127 | 430 | 430 | 602 |
| Grey Plover <i>P. squatarola</i> | 1 | 312 | - | | 313 |
| Grey-headed Lapwing <i>Vanellus cinereus</i> | 4 | | | | 4 |
| Great Knot <i>Calidris tenuirostris</i> | 23 | 7 | 560 | 560 | 590 |
| Red Knot <i>C. canutus</i> | 7 | 6 | 31 | 31 | 44 |
| Sanderling <i>C. alba</i> | | | 6 | 6 | 6 |
| Red-necked Stint <i>C. ruficollis</i> | 17 | 25 | 800 | 1143 | 1185 |
| Temminck's Stint <i>C. temminckii</i> | 1 | 13 | | | 14 |
| Long-toed Stint <i>C. subminuta</i> | 7 | 6 | 8 | 8 | 21 |
| Sharp-tailed Sandpiper <i>C. acuminata</i> | 3 | | 65 | 65 | 68 |
| Curlew Sandpiper <i>C. ferruginea</i> | 40 | | 5770 | 5770 | 5810 |
| Dunlin <i>C. alpina</i> | 1 | 3100 | 2 | 2 | 3103 |
| Spoon-billed Sandpiper <i>E. pygmeus</i> | | | 1 | 1 | 1 |
| Broad-billed Sandpiper <i>Limicola falcinellus</i> | 33 | 7 | 140 | 140 | 180 |
| Ruff <i>Philomachus pugnax</i> | 2 | | 1 | 1 | 3 |
| Long-billed Dowitcher <i>Limnodromus scolopaceus</i> | | 1 | 2 | 2 | 3 |
| Asian Dowitcher <i>L. semipalmatus</i> | 9 | | 49 | 49 | 58 |
| Black-tailed Godwit <i>Limosa limosa</i> | | 366 | 1002 | 1002 | 1368 |
| Bar-tailed Godwit <i>L. lapponica</i> | 14 | 4 | 30 | 30 | 48 |
| Whimbrel <i>N. phaeopus</i> | 90 | 1 | 47 | 47 | 138 |
| Eurasian Curlew <i>N. arquata</i> | 26 | 810 | - | | 836 |
| Far Eastern Curlew <i>N. madagascariensis</i> | | 1 | 14 | 14 | 15 |
| Spotted Redshank <i>Tringa erythropus</i> | 7 | 512 | 1107 | 1107 | 1626 |
| Common Redshank <i>T. totanus</i> | 799 | - | 1980 | 1980 | 2779 |

| | | | | | |
|--|------|--------|--------|--------|--------|
| Marsh Sandpiper <i>T. stagnatilis</i> | | - | 1529 | 1529 | 1529 |
| Common Greenshank <i>T. nebularia</i> | 576 | - | 1230 | 1492 | 2068 |
| Nordmann's Greenshank <i>T. guttifer</i> | | | 17 | 31 | 31 |
| Green Sandpiper <i>T. ochropus</i> | | 46 | | | 46 |
| Wood Sandpiper <i>T. glareola</i> | 266 | 41 | 29 | 29 | 336 |
| Terek Sandpiper <i>Xenus cinereus</i> | 21 | | 368 | 526 | 547 |
| Common Sandpiper <i>Actitis hypoleucos</i> | 3 | 127 | - | | 130 |
| Grey-tailed Tattler <i>Heteroscelus brevipes</i> | 4 | | 62 | 62 | 62 |
| Ruddy Turnstone <i>Arenaria interpres</i> | 3 | | 102 | 102 | 102 |
| Red-necked Phalarope <i>Phalaropus lobatus</i> | | | 32 | 32 | 32 |
| NUMBER OF SPECIES | 31 | 27 | 38 | 33 | 41 |
| TOTAL NUMBER OF BIRDS | 2720 | 12,420 | 15,925 | 16,804 | 29,580 |

Note: a dash indicates that birds were recorded, but are not thought to comprise different individuals to those in other seasons.

Regionally important numbers

Carey and Young (1999) listed a number of wader species for which Mai Po and Deep Bay held, or possibly held, regionally important numbers during five-year periods in the 1990s. Regionally important is defined as 1% of the flyway or regional population (criteria 3c for determining a wetland of international importance), and the latter is based on population estimates contained in Rose and Scott (1997). (As the figure for Spotted Redshank appears to be on the low side, the next higher population level is used). These species are listed in Table 2, as are the percentages of the regional population of each estimated to have occurred in the Ramsar Site during the course of July 2000 to June 2001.

Table 2. Species recorded in regionally important numbers in Deep Bay during July 2000 to June 2001.

| species | flyway/regional population# | number recorded | percentage |
|---|-----------------------------|-----------------|------------|
| Black-winged Stilt <i>H. himantopus</i> | 10,000-100,000 | 443 | 0.45-4.5% |
| Pied Avocet <i>Recurvirostra avosetta</i> | 10,000-25,000 | 1926 | 7.7-19.3% |
| Kentish Plover <i>C. alexandrinus</i> | 25,000-1,000,000 | 2375 | 0.24-9.5% |
| Greater Sand Plover <i>C. leschenaultii</i> | 99,000 | 828 | 0.83% |
| Grey Plover <i>P. squatarola</i> | 25,000-100,000 | 313 | 0.31-1.23% |
| Curlew Sandpiper <i>C. ferruginea</i> | 471,000 | 5810 | 1.23% |
| Dunlin <i>C. alpina</i> | 25,000-1,000,000 | 3103 | 0.31-12.4% |
| Eurasian Curlew <i>N. arquata</i> | 10,000-100,000 | 836 | 0.8-8.4% |
| Spotted Redshank <i>Tringa erythropus</i> | 25,000-100,000* | 1626 | 1.63-6.5% |
| Marsh Sandpiper <i>T. stagnatilis</i> | 90,000 | 1529 | 1.7% |
| Common Greenshank <i>T. nebularia</i> | 40,000 | 2068 | 5.17% |
| Nordmann's Greenshank <i>T. guttifer</i> | 1000 | 31 | 3.1% |
| Terek Sandpiper <i>Xenus cinereus</i> | 25,000-1,000,000 | 547 | 0.06-2.19% |

figures from Rose and Scott (1997) apart from that marked * whose population estimate is amended to one class higher

Threatened species

With regard to species listed in BirdLife International (2000), the following were recorded during the 12-month period July 2000 to June 2001 (population figures from Rose and Scott 1997):

- Spoon-billed Sandpiper: listed as Vulnerable, the population is estimated at 2000-2800 pairs. Only one individual occurred during the 12-month period.
- Asian Dowitcher: listed as Near-threatened, the world population is estimated to be 15,000-20,000 birds. At least 49 birds passed through during the period under consideration, a relatively low figure.
- Far Eastern Curlew: listed as Near-threatened, the world population is estimated to be 21,000 birds. Fifteen birds were recorded during the 12-month period.
- Nordmann's Greenshank: listed as Endangered (i.e. facing a very high risk of extinction in the wild in the near future), the world population is estimated to be 1000 birds. A total of 31 birds during spring passage continues the stabilisation of totals recorded which occurred after 1998, during which year occurred the poorest showing since representative records of this species' began in 1987.

Other observations

The regular observations brought a series of records of leg-flagged birds during spring passage (see Appendix 2). These records have been sent to the Australasian Wader Studies Group, which organises the leg-flagging programme involved.

In addition, when possible, birds passing through were assigned to an age-class of juvenile or non-juvenile. Non-juvenile was chosen as it is rarely possible in the field to be certain with regard to adult or first-summer (i.e. second calendar-year). Details are provided in Appendix 3.

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